DOCUMENT RESUME

ED 274 880 CE 045 490

AUTHOR Olson, Jean T., Ed.
TITLE Conference on Adult Literacy and Computers (Spring Hill, Minnesota, November 20-22, 1985).
INSTITUTION Gannett Foundation, Rochester, NY.
PUB DATE [85]
NOTE 67p.; Proceedings of a conference hosted by the Technology for Literacy Center, St. Paul, MN and organized by the Adult Literacy and Computers Advisory Committee.
PUB TYPE Collected Works - Conference Proceedings (021) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Access to Education; *Adult Basic Education; *Adult Literacy; Adult Programs; *Computer Assisted Instruction; Conference Proceedings; *Courseware; *Illiteracy; Information Technology; Program Administration; Program Effectiveness

ABSTRACT

Materials from a conference on computer use in adult literacy programs are provided. Introductory materials include a history of the conference and the agenda. A summary of the keynote address, "Impact of New Information Technologies on Literacy" (Linda Roberts), is followed by a brief overview of the conference opening. Descriptions are provided of each participant and his or her program. The two following sections focus on the technical representatives and their observations on the issues discussions and the site visitation. Summaries are provided of the issues discussions. The six topics are quality software, low-level software (0-4 grades), technology, instructional effectiveness, management, and access. Each summary consists of a brief statement of the issue, a list of questions about the topic and its role in adult literacy which the moderator used to guide the discussion, a statement of goals and recommendations, and a summary of the notes and comments recorded during the session on flip charts by the moderators. Other contents include a brief note on a presentation on IBM's role in addressing adult literacy, a brief discussion of the use of Wilson Learning's Innovator (a computerized system customized for group needs), and a listing of participant comments regarding conference effects arranged in the following categories: individual-level effects, networking, efforts at research to support the field of adult literacy in general, and development of the field. A section on future directions is also included. Additional resources include advisory committee, participant, and technical representative addresses; a listing and description of software used by participants; a reprint of an article on computer-assisted instruction; and a resource list. (YLB)

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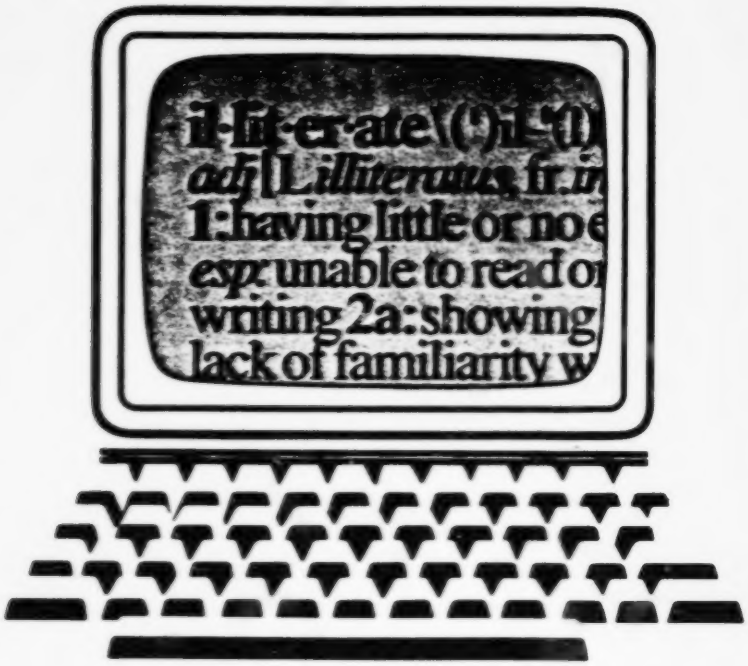

Conference on Adult Literacy and Computers

November 20-22, 1985
Spring Hill, Minnesota

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Conference Coordinator
Karen Ray,
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Jean T. Olson
Editor

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Introduction

Christy Bulkeley, Gannett Foundation

"What if every readily accessible computer terminal--at bank teller windows, news rooms, business offices--were available to and used a few hours daily by an adult learner to read or to read better?"

That image, bolstered by the enthusiasm of three earlier grant recipients working with computers in adult literacy, convinced Gannett Foundation leaders to invest part of the special, 50th Anniversary Literacy Project in exploring the status and potential of computers in adult literacy.

Frank E. Gannett, founder of the Gannett Group of Newspapers, created the Foundation, in part, to serve charitable interests in communities served by his newspapers.

Literacy reflected the late Mr. Gannett's interest in education and in the health of those communities. Literacy also has been a long-standing concern of the present Foundation president, Eugene C. Dorsey.

The 50th Anniversary Literacy Project support for local literacy organizations in communities with Gannett Co., Inc., properties and for the computer inquiry thus respected the strong local traditions of both the Gannett company and of volunteerism in adult literacy, while also investing in visions for the future.

Key to the successful launching of the Adult Literacy and Computers project were Jean Hammink, the literacy specialist for B. Dalton Booksellers, and Terilyn Turner, manager of the Technology for Literacy Center, women of vision, commitment and street savvy. Their knowledge and energy, combined with the Foundation's financial resources, made possible the first national gathering on Adult Literacy and Computers as well as progress beyond measure.

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History of conference

By any measure currently in use, the number of functional illiterates continues to grow. The national cost of illiteracy has been estimated at $6 billion yearly in welfare programs and unemployment compensation. The loss of employment for functional illiterates is estimated at an additional $237 billion a year. Illiteracy has been linked to a host of other problems, including crime, violence, and family abuse.

The severity of the problem and the paucity of resources to address it make the situation critical. Literacy programs need a new approach to deal with the rising number of functional illiterates. One of the more promising ideas is the application of technology to the problem of illiteracy. In the last five years, a new tool has arrived on the scene in adult literacy education: the microcomputer.

The microcomputer is a self-contained unit that allows a flexibility not known with on-line computer terminals. It is portable and relatively inexpensive. Advances in technology and the development of new materials have created new possibilities in the area of basic literacy instruction.

The computer has some striking benefits for this type of instruction. It is infinitely patient; only the computer knows when the student makes an error. It never hurries or rejects the learner. It offers the learner privacy. Computers afford a flexibility impossible in classroom and tutoring arrangements. Adults can receive instruction at their convenience, and materials can be individualized for each student. Computers provide systematic feedback and facilitate recordkeeping of student progress.

Experimental studies and pilot programs have confirmed the advantages of computer-assisted instruction for adult literacy; however, the use of computers in literacy programs has been sporadic. Lack of resources and software are frequently cited as reasons that adult literacy programs have not fully utilized the power of the computer. But, the single greatest need of literacy programs eager to use the computer is information.

In June, 1985, the **Gannett Foundation** sponsored a meeting of a group of literacy professionals interested in the use of computers in literacy instruction. During the session, which was held in Minneapolis, these people discussed their concerns, shared their experiences, and projected a vision of the future encompassing the use of computers in adult literacy programs.

Lack of information and the means to effectively share information were raised as issues repeatedly throughout the meeting. Every member of the group had received frequent requests from literacy programs throughout the country for information on software and hardware selection, evaluation of software, appropriate use of computers (instructional vs. management), training for staff in computer usage, and the latest developments in technology.

The group expressed the need for a national network to promote the use of computers in literacy programs, to share information among interested individuals, and to actually plan for the future. The most immediate need was to identify persons who were using computers in literacy programs and to put them in touch with each other. The group agreed that there needed to be a national invitational conference for the current leaders in the field of computers and adult literacy.

After obtaining funding for such a project from the **Gannett Foundation**, the group, now formally known as the **Adult Literacy and Computers Advisory Committee**, began planning a conference that would provide a forum for addressing literacy and technology issues, establish a national network of literacy programs using computers, and disseminate information generated at the conference to literacy programs throughout the country.

The long-term goals identified by the Adult Literacy and

Computers Advisory Committee were--

--to support the development of computer use in adult literacy programs, applying the computer's unique capabilities to the areas of management and instruction, and to provide solutions for the illiteracy problem in the nation.

--to create an effective dissemination system that would provide ready access to information on computers and other forms of technology, selection of software and hardware, training, curriculum design, evaluation, and organizational recommendations for adult literacy programs.

National leaders representing a range of literacy systems, including Adult Basic Education, English as a Second Language, community-based organizations, job training, community colleges, volunteer programs, and librarians were asked to nominate persons to attend the conference. Advisory board members decided on whom to invite to the conference based on involvement in or initiation of the use of computers in an adult literacy program; access to larger groups through information networks; and representativeness of the types of literacy systems. Size of community and geographic regions were also criteria. Fifty individuals eventually were selected to participate, the number being kept deliberately small to insure the development of a cohesive group identity.

The advisory board played a primary role in planning the conference which was entitled the **Adult Literacy and Computers Conference.** It was held from November 20-22, 1985, at the Spring Hill Conference Center, near Minneapolis. The **Technology for Literacy Center,** St. Paul, Minnesota, served as host for the event.

Agenda of conference

WEDNESDAY, NOVEMBER 20

Reception

Keynote Address*

THURSDAY, NOVEMBER 21

Conference Opening*
Introductions, Purpose, Goals, and Design

Program Discussions*
Concurrent sessions for networking and sharing program information

General Session

General Session
Introduction to Innovator, instructions for issues groups

Issues Discussions*
Round 1

Issues Discussions*
Round 2

General Session
Technical Representative Panel*
"Response to Issues Discussion" and Opinion Polling

Technology Demonstrations*
on site tour of Technology for Literacy Center, St. Paul; demonstrations of software, interactive video, discourse systems, on-line and micro computers

FRIDAY, NOVEMBER 22

General Session*
IBM's Investigation of Literacy by Bill Speights, IBM

Focus on the Future*
Clarification of values and feasibility of issues recommendations

Identification of areas for action planning, areas for further discussion, and conference follow-up

Focus on the Future*
Prioritize activities
Identify resources

Conference Closure
Summarizing
Evaluating
Comments

Keynote speaker

The keynote speaker was **Linda Roberts**, senior policy analyst for the **Office of Technology Assessment** (OTA). The title of her address was **"Impact of New Information Technologies on Literacy."**

(OTA is a bipartisan agency of the U.S. Congress. It was established in 1972 as part of the Technology Assessment Act to provide Congress with information about how rapidly expanding and changing technologies will impact our natural and social environments. OTA operates independently of the executive and judicial branches of government and serves congressional committees dealing with questions of technology.)

Technology is the tool that will enhance opportunity, resources, and services for communication, learning, and literacy, according to Linda Roberts.

Roberts based her observations on two perspectives: one based on her role as a policy analyst in anticipating, understanding, and considering the consequences of technology applications in the determination of public policy on existing and emerging national problems, and the other from her experience teaching high school drop-outs in an information- and technology-poor environment. She challenged the conference to examine the goals for literacy and the application of technology.

"I believe that the excitement, the challenge for us now and in the future is in exploring these issues, raising questions, and finding answers by putting these perspectives together."

The rapid advances in computers and telecommunications technologies seen over the last two decades will continue through the 1980s and into the 1990s. Improved reliability of computer-based systems and the performance of more functions faster. cheaper, and more flexibly are expected, and even the bottleneck in the process, software engineering design, should provide breakthroughs.

"Some experts expect that eventual improvements will result in major breakthroughs, which, in effect, will increase software productivity while decreasing the effort required to design improved man-machine interfaces, more complicated and complex applications, and handle virtually any form of data. Moreover, the expected advances in artificial intelligence research and development in areas such as vision processing, speech synthesis, and natural language processing show promise for a range of applications, including expert systems."

Roberts outlined seven dimensions on which technology can be assessed generally and, more specifically, in its application to literacy.

1. **Communication and networking** provide a means for the academic, business, and scientific communities to share work, data, and, in some cases, computer resources themselves. Insuring that these resources are available to everyone is a challenge.

2. **Improved data collection capabilities** enable tracking an adult learner working on a variety of tasks. Drawing on speech recognition and development of audio and visual input devices, machines can be designed to fit the needs of all learners, even those operating at the lowest levels of literacy.

3. **Enhanced information storage and retrieval** improves **accessibility** through computer-readable databases to materials that have traditionally been published in books and stored in libraries.

4. **New ways to handle data and combinations of ideas and concepts** are possible because of new ways of organizing information. Access to information that matches a learner's interests, level of skill, and needs will be possible. as well as access to information by a community of users, such as literacy volunteers who could collect and exchange information on methods and resources.

5. **Increased calculation abilities** increase computing power and speed. Equations, algorithims, and mathematical models have led to the generation of graphics and art.

6. **New ways of presenting information** may make it more

understandable to learners. The ability to represent ideas and concepts graphically may present opportunities for enhanced instruction.

7. **Control afforded by computer technologies will not replace human functioning, but might enhance it.** Citing examples of voice-activated robots aiding immobilized senior citizens and a computer-controlled speech synthesizer enabling a young man to chant the Torah at his bar mitzvah, Roberts suggested that ways for adaptive devices to become part of the tools for learning and training for those handicapped by their lack of reading and writing skills should be explored.

While the benefits of the application of computer technology in improving literacy cannot be denied, the negative impact must be considered, too.

"It is argued that instruction might become fully automatic, mechanized, and impersonal. Not only is there concern about such control, but deeper anxiety that computer-controlled instruction will proliferate and replace personal, human interaction."

Protecting against the gaps between the information and technologically rich and information poor is necessary. The conclusion that technology is only for experts is accepted much too readily.

The increasing proprietary nature of information is also a concern.

"As information increases in economic value and is treated as a commodity to be bought and sold in the marketplace, in direct competition with the notion of information as a public good, there is concern again for those who are underskilled, out of the information mainstream, and least able to pay."

There is a danger that a focus on technology rather than consideration for human needs or findings of research on learning, motivation, perception, and human development will drive the development of hardware, software, and systems. The challenge is to avoid or reduce the negative consequences and maximize the benefits of technology. By making intelligent choices, setting priorities, and charting direction, progress will be made.

"My vision is that we all have a role to play and work to do. Practitioners and researchers can help technology developers understand the needs; those in basic research, those in development can help us understand the alternatives and the possibilities; leaders at all levels can make clear the choices. From my perspectives, I believe that rather than the driver, technology is the tool."

Conference opening

Participants were welcomed to the first conference on technology and adult literacy. Introductions of the conference advisory committee were made, and the purpose, objectives, and design of the conference were explained.

Those objectives were--

-- to provide a forum for dialogue among practitioners and resource persons that will clarify current practices concerning the use of computers in adult literacy programs;

--to provide a forum that encourages discussion of issues and the projection of the future of technology in adult literacy programs;

-- to provide an opportunity for participants to exchange information of current uses of hardware and software in adult literacy programs;

--to develop an action plan to promote use of computers in literacy settings using conference discussion of issues as a base for planning steps;

-- to establish a national network of literacy practitioners concerning the use of technology in literacy programs;

-- to document information gained from the conference for dissemination to the national literacy field.

Participants had the opportunity to gather materials describing the programs represented.

Participants/Programs descriptions

In half-hour rounds, each participant discussed his or her program in a small group. Topics on each program covered included curriculum, services, and program design. Participants selected four sessions to attend.

PATRICIA I. ANDERSON *is the department head of Computer Education at the* **Martinez Adult School**, *Martinez, California. The Martinez Adult School includes an individualized, self-paced lab for self-improvement and/or diploma credit in math, English, computer literacy, and computer operations. Five years ago, Anderson initiated a literacy competency lab which focused on reading, writing, and math. The program is totally individualized. While there is some integration with published materials, most is center-developed. Anderson develops software where needed and has formed her own company for distribution.*

Anderson is interested in participating in a network on adult literacy and developing a software rating guide for adults as well as a competency requirement list for adult literacy.

JOHN T. ARENZ is the ABE Program Director of the **AB/CE Consortium**, a 10-district ABE program, in Cass Lake, Minnesota. The program is charged with providing educational services for all adults not enrolled in public schools, and utilizes individualized and tutoring instructional strategies. Arenz is involved in computer software evaluation and is a part of a major statewide effort in software review. He has also received a grant to assist AB/CE programs in the area of computer technology.

ELLEN ARNSMEYER *is the vocational evaluator at the* **Lakes Country Rehabilitation Center** *(LCRC) in Springfield, Missouri. LCRC's purpose is to provide evaluation, adjustment services, skills training, support services, and substance abuse counseling to mentally and physically handicapped persons to assist them in maximizing their independent living capabilities and obtaining an earned income. Literacy skills are taught as a means of increasing employability. Arnsmeyer is developing low-level programs and software for job-training programs.*

Arnsmeyer wants to locate beginning-level materials that are directed to adults and that progress quickly to job-related skills.

EUNICE N. ASKOV is a professor of education and the director of the **Institute for the Study of Adult Literacy** at **Penn State University** in University Park, Pennsylvania. The Institute's mission is to encourage research and development related to adult literacy, to improve practices such as staff development and evaluation, and to provide leadership and serve as advocate for different types of programs. The Institute is intended to function at a national and international level. Askov has developed CAI courseware that focuses on teaching survival, vocabulary and beginning reading skills to adult non-readers. This has included development of computer courseware for 0-4 grade reading level with diagnostic, prescriptive capabilities, as well as a management system. She developed similar courseware for non-English speaking immigrants in Australia.

Askov is interested in the use of interactive audiodisk and videodisk, voice synthesizers, and the interactive and responsive CAI.

CAROLE BARTHOLOMEW is the Adult Education Staff Development specialist for **The Northern Institute** in Anchorage, Alaska. The Adult Education Staff Development Program provides training, curriculum coordination, and technical assistance to all adult/educational/literacy regional directors and instructors in Alaska. Bartholomew provides on-site training in staff development methods as well as materials workshops for literacy program paid staff and volunteers. She is a writing specialist and uses computers in teaching writing skills. She also writes software appropriate for adults.

Bartholomew wants to continue communication with conference participants. She is interested in the development of an awareness campaign for encouraging publishers to increase production and quality of basic skills literacy software, and in identifying funding sources for research

and development of basic literacy skills software.

ELIZABETH A. BUCKLEY is the assistant director of the Adult Program of the **Adult Learning Center** in Great Neck, New York. The goal of the Center is to help underemployed and undereducated adults upgrade their educational skills, achieve a higher degree of autonomy, and improve their quality of life. This is carried out through ESL, ABE, HSE Preparation, and an External High School Diploma Program, as well as a variety of counseling services. The Center is also used for in-service training workshops and seminars. Buckley has piloted a mini-computer series for adult literacy, and conducted a study into its effectiveness. She serves as a consultant to other programs developing CAI.

Buckley wants to pursue how to introduce, utilize, and incorporate computers in instructional programs for ABE/ESLprograms, how to facilitate the selection and evaluation of software, and development of effective staff training.

CHRISTY C. BULKELEY *is a vice-president of the* **Gannett Foundation**, *Rochester, New York. Gannett allocated $500,000 in grant aid to literacy in 1985. Bulkeley has primary responsibility for literacy grant giving and special projects for the Foundation. She has been a newspaper editor and publisher, and is a member of the Adult Literacy and Computer Conference Advisory Committee.*

LINDA CHURCH is the director of Field Services of **Laubach Literacy Action** (LLA) in Syracuse, New York. LLA is the largest volunteer-based program in the U.S. and is independently operated. Working with libraries, community colleges, churches, community-based organizations, and national offices, LLA enables adults to acquire basic level skills in listening, reading, speaking, writing, and math. It provides resources and materials. Church has worked in adult literacy for 12 years, and has developed innovative materials for tutors and volunteers.

Church is seeking applications to literacy for 0-5 levels, especially 0-3. She is also interested in management application to volunteer programs.

BOB CLAUSEN *is Director of* **Community College Instructional Services** *in the* **Oregon Department of Education** *in Salem, Oregon, and past State Director of Adult Education. Clausen is involved in expanding the use of computers in adult literacy programs and has served as chair of the Region X Adult Education Consortium, which is composed of Alaska, Idaho, Oregon, and Washington. The Region X Software Consortium, which he helped organize and of which is the chair, is known for its analysis of software that is appropriate for adults with literacy needs and for national dissemination of information on CAI. He is a member of the Adult Literacy and Computers Conference Advisory Committee.*

JEAN C. COLEMAN is the director of the Office for Library Outreach Services of the **American Library Association** in Chicago, Illinois. The Office is responsible for helping libraries to develop literacy programs throughout the U.S. Coleman is known for her involvement in literacy through the National Literacy Coalition and for being one of the first in the nation to propose a national literacy initiative.

Coleman is interested in hardware and software for working with pre-GED level adults.

MARY CROSS *is an education program specialist with* **Adult Literacy Initiative** *in Washington, D.C. This program coordinates federal activities, increases public awareness, and encourages private and public cooperation in literacy efforts. Cross has planned meetings about the use of technology for literacy training. She is developing and co-managing a telecommunications system for literacy providers, LitLine. She is the primary liaison between the Adult Literacy Initiative and the Public TV Project.*

JINX CROUCH is the executive director of the **Literacy Volunteers of America, Inc.** (LVA) in Syracuse, New York. LVA is a national non-profit organization that develops community-level volunteer literacy programs. LVA produces training materials for volunteer tutors and program managers, coordinates and supports the services of its own network, and provides technical assistance to other groups interested in literacy. Crouch specializes in dissemination of information about management systems and CAI for volunteers.

Crouch is interested in obtaining objective evaluative information on state-of-the-art applications of computers in literacy instruction and program management, as well as a means of exchanging information.

PAUL DELKER *is the director of the* **Division of Adult Education** *of the* **U.S. Department of Education** *in Washington, D.C. This division is responsible for administering the federal adult basic and adult secondary education programs under the Adult Education Act. Delker is well-known in the educational field, having written numerous articles on adult education, the immigrant experience, and education in the U.S.*

Delker is interested in evaluation standards for CAI in literacy.

GAIL DOWLING is the coordinator of the **Vermont Institute for Self-Reliance** (VISR) in East Calais, Vermont. VISR offers long-distance education through correspondence courses, newspaper GED courses, computer learning stations, lending software to students, and monthly seminars using computers and other technology. Dowling directs the statewide correspondence instruction in Vermont. During the last five years, she has worked on developing computer software for literacy instruction. She has worked on serving rural students by programming computer software and leaving computers in homes; she also works with volunteer students to provide necessary tutoring.

Dowling is interested in very low-level reading software and interactive video technology.

THOMAS DUFFY *is the director of the* **Communications Design Center** *(CDC) in Pittsburgh, Pennsylvania. CDC researches instructional strategies. Duffy is a co-developer of the U.S. Navy's Wisher-Duffy CAI System, and is now involved in evaluating and refining experimental applications of the system. He is nationally known for his software designs in basic skills and interactive video used in military programs.*

Duffy is interested in skill requirements for tutors and teachers.

JUNE EISELSTEIN is the director of the **Mary H. Weir Public Library** in Weirton, West Virginia. The library provides access to microcomputers and free computer literacy training to the students and tutors involved in the library's Literacy Program, as well as to the general public. In addition to participating in a Department of Defense technology transfer project on reading skills improvement, a collection of business and educational software has been developed for the Literacy Program. Eiselstein is a project director for local tests of the Wisher-Duffy CAI program.

Eiselstein is interested in office management; record-keeping that combines the needs of ABE programs, Laubach, and LVA; authoring systems for CAI programs for adult learners.

GALE EWER *is the director of the* **Bureau of Student, Community, and Adult Services** *of the* **Massachusetts Department of Education** *in West Springfield, Massachusetts. The Bureau is involved in funding, technical assistance, training, and networking for a statewide computer project for adult education begun in 1982. ABE administrators and administrative assistants, on both the state and local levels, have been trained in the use of microcomputers for recordkeeping. Over half of the adult learning centers in the state are using microcomputers for instructional purposes. As director of ABE, Ewer has funded and monitored CAI projects.*

Ewer is interested in software for the 0-4 reading level, computer use for ESL students illiterate in their native language, and the use of word processors for teaching writing to 0-4 level adults.

JOHN FLEISCHMAN is the Instructional Media Coordinator for the **Correctional Education Division** of the **Hacienda La Puente Unified School District** in Los Angeles, California. This program provides education to 75,000 inmates per year incarcerated in Los Angeles County jails. The focus is basic education instruction, but high school completion is also addressed; instruction is competency based. Fleischman ties existing software to available basic skills paper materials. He is working on staff development and interactive video used with CAI.

Fleischman wants to explore the use of interactive video for life and basic skills instruction, application of CAI in non-traditional learning centers, and peer tutorial training programs.

RICHARD H. HAGEMEYER *is the president of* **Central Piedmont Community College** *in Charlotte, North Carolina. The College's ABLE effort hopes to provide a quality, time-effective program of teaching basic reading and math skills to adults to improve their literacy levels. Hagemeyer conceived and initiated the ABLE program, 80 percent of which is devoted to CAI in literacy. He has been instrumental in developing alternative instructional strategies, offering courses via television, telephone, computer, and radio in the community college system.*

JEAN HAMMINK is the literacy specialist for **B. Dalton Bookseller**, Minneapolis, Minnesota. In that position, Hammink is responsible for linking the company's interest in literacy to the literacy movement nationally. Hammink has an extensive background in basic education and literacy. She is a member of the Adult Literacy and Computers Conference Advisory Committee.

Hammink is interested in projecting on the future of technology and how it can best be applied to adult literacy services.

MARIA (TORI) IMPINK-HERNANDEZ *is a bilingual resource analyst for the* **National Clearinghouse on Bilingual Education** *in Roslind, Virginia. The Clearinghouse collects, analyzes, and disseminates information related to the education of minority language populations. Included in its resources on education programs for minority language and limited-English proficient adults is information on adult literacy programs, instructional technologies, and instructional courseware appropriate for its target populations.*

DON HOLZNAGEL is the director of the **Computer Technology Program** for the **Northwest Regional Educational Laboratory** in Portland, Oregon. This program conducts research, development, and technical assistance and training in computer-based education for public and private education agencies. Holznagel has directed the Program for two years, and has worked in computer education for 16.

Holznagel is interested in identifying desirable characteristics of instructional software for adults.

CYNTHIA WILSON JOHNSTON *is the Director of* **ABLE** *at* **Central Piedmont Community College** *in Charlotte, North Carolina. The mission of ABLE is to provide a free, educational program to teach basic reading and math skills to adults using computers. It hopes to educate the community about existing literacy problems and to recruit adults who need basic skills improvement and retain them in the program until their need have been met. Johnston has directed the ABLE Center since 1983 and has received national recognition for her literacy program.*

Johnston is interested in database management of student records and student progress tracking. She would also like to use networking through microcomputers for sharing instructional courseware and to explore its development.

JANE NISSEN LAIDLEY is the executive director of **People's Computer Company, Inc.** (PCC, Inc.) in San Ramon, California. PCC, Inc. has worked on various computer-related projects since its inception in 1972. A curriculum for the use of microcomputers by tutors and students has been developed by PCC, Inc. It is also providing program training related to language arts methodology and computer use for adult literacy purposes, and is carrying out an evaluation of the Richmond (California) Public Library Learning Center, established under the Literacy for Every Adult Project. Laidley is project consultant for this program, and is working on all aspects of the project described above.

Laidley is interested in learning about current computer literacy projects and the discussion of curricular designs and concerns for the adult learner.

MARTHA A. LANE *is the coordinator of the* **Volunteer Reading Aides Program** *of the* **Lutheran Church Women**, *based in Philadelphia, Pennsylvania. This program encourages, enables, and supports groups and individuals teaching adults to read and write. This is done through information and referral, technical assistance, consultative services, development and publication of teaching and learning materials, and advocating for and with adult students. The Program operates in the U.S. and Canada, and plans to research, field-test and recommend ways in which literacy projects could use computers to enhance teaching and program management, and to provide training in CAI for students, tutors, and program administrators.*

Lane is interested in computer curriculum for beginning basic literacy students; development of individual learning plans; students' reactions to CAI; and how to encourage small literacy projects to use computers in instruction and management.

RICHARD J. LAVIN is the executive director of the **Merrimack Education Center** in Chelmsford, Massachusetts. The Center is a non-profit organization that provides its clients with services in the areas of technical assistance, research, and training in the application of technology. It is assisting the Massachusetts Department of Education in the design and implementation of a comprehensive process for the use of computer technologies for adult education. The Center previews software and serves as a central resource for CAI in the state's ABE program. Lavin provides technical assistance in areas related to CAI, e.g., in-service training, production of guidelines for selection of adult learning software.

Lavin is interested in policy issues, such as planning; in other technologies, such as interactive video; and in developing partnerships with business and industry.

RENEE S. LERCHE *is the director of* **The Network, Inc.**, *in Andover, Massachusetts. The Network, Inc., is a private, non-profit corporation dedicated to enhancing learning and to strengthening and improving systems designed to foster learning. The Network, Inc., reviews software packages and systems for instruction and management, and assists in integrating technology into an instructional design. Lerche specializes in CAI for job-training programs. She is a former director of the national Adult Literacy Project and the author of Effective Literacy Programs.*

Lerche is interested in integrating CAI and other technologies into educational delivery systems. She wants to explore the appropriate uses of interactive videodisk technology in literacy instruction.

JAMES S. LINDBERG is an adult education consultant for the **California State Department of Education** in Sacramento, California. He is responsible for technical assistance, computer literacy, and CAI to adult basic education schools in California. He conducts workshops on the uses of computers in adult education and assists districts in setting up management programs for adult education.

Lindberg is interested in the development of programs that focus on adult competencies as they relate to literacy and the use of computers for teaching learning-disabled adults.

LUCY TRIBBLE MacDONALD *is an instructor of essential skills at* **Chemeketa Community College** *in Salem, Oregon. The ABE program at Chemeketa includes ABE, GED, ESL, instruction for the hearing-impaired, tutoring, and development education college courses. MacDonald has written a how-to manual for literacy teachers on using microcomputers, particularly the Apple IIe. She has developed a spelling program using the Hartley Connect Device and is a leader in the area of using laser videodisk for basic skills instruction. She also reviews software as a member of the Region X Software Consortium.*

MacDonald is interested in interactive video instruction, networking, and information about low-level CAI.

DUANE K. McCALLISTER is the president and publisher of the **Hattiesburg American**, a newspaper in Hattiesburg, Mississippi, and serves on the board of directors of the **Hattiesburg Education Literacy Project, Inc.** (HELP). HELP is a non-profit corporation that encompasses a basic literacy program for business employees using microcomputers as the primary means of instruction. McCallister has reviewed software for teaching basic reading and writing skills in the workplace.

McCallister is interested and how to identify, recruit, and motivate students, and in means to convince communities of the importance of addressing the problems of adult illiteracy.

DONNA MILLER-PARKER *is an instructor and volunteer coordinator at the* **Renton Vocational Institute**, *in Renton, Washington. The Institute's Learning Center houses the ABE program, which offers basic skills instruction in reading, writing, math, life-coping skills, and ESL. Instruction is offered in both independent study and classroom settings. Miller-Parker coordinated an ABE program called Help One Student to Succeed (HOSTS), and has adapted a computerized basic skills management system from K-12 to adult level.*

Miller-Parker is interested in research regarding the efficacy of

people without keyboarding skills, voice synthesizers, software evaluation, and current research into CAI in literacy.

LYNNE ORNSTEIN is the education director of **The Fortune Society** in New York, New York. Utilizing one-to-one counseling and tutoring, vocational training, and job development, this private, non-profit organization seeks to widen options and opportunities available to ex-offenders and young people who have been in trouble with the law. This is done by improving students' reading, writing, and math skills so they can enter training programs, secure jobs, and feel better about themselves. Ornstein uses microcomputers in the Society's educational program. She is an expert at using CAI for math, and is a frequent speaker on this subject.

Ornstein is interested in eliminating the lack of available reading instruction software for adult beginning readers.

W. LEE PIERCE *is the project director of the* **Skills Improvement Program** *of the* **Hattiesburg Education Literacy Project** *and* **ABE Microcomputer Software Clearinghouse**. *This non-profit corporation, which is associated with a university, hopes to improve the literacy levels and functioning skills of university employees, especially the support staff.*

Pierce is interested in the development of input devices for people without keyboarding skills, voice synthesizers, software evaluation, and current research into CAI in literacy.

RICHARD A. POLLAK is the director of special projects for the **Minnesota Educational Computing Consortium** (MECC) in St. Paul, Minnesota. MECC is responsible for initiating and implementing program evaluation, research and development of new technologies, and technology-supported system studies related to innovative uses of computers in education. Pollak is in charge of research and development for MECC. He is interested in long-term development of computer use and has designed interaction video educational systems.

Pollak is interested in utilities to help adult literacy.

DANIEL RABIDEAU is the director of the **Literacy Assistance Center** in New York City. The Center is an independent, non-profit organization whose mission is to promote the expansion of effective literacy instruction in New York City. It does not operate classes or tutoring programs, but rather supports the institutions, public and private, that provide literacy services, and strengthens the links among them.

SUSAN RAPPAPORT *is a technology advisor for the* **Micro--Computer Project, New York Public Library** *in New York, New York. The Library offers a literacy program using computers in basic skills instruction. Rappaport is responsible for selection and evaluation of hardware and software, staff training, and procedures for all microcomputer use for the Library. She is involved in New York University's program in computer science and has written numerous articles and made many conference presentations in this field.*

Rappaport is interested in software evaluation and in the use of voice synthesizers.

PATRICIA L. RICKARD is the director of the **Comprehensive Assessment System** for **Adult Basic Education Project** (CASAS) in San Diego, California. This project includes a component for computerized instructional management in its overall program of placing students into programs and levels, diagnosing learning needs and targeting relevant instruction, monitoring student progress toward goals, certifying attainment of competencies at each program level, and providing materials and training that are adaptable to a variety of educational settings and linked to competency-based curriculum and instruction. Rickard developed and implemented a computer management system for assessment in adult literacy programs. She directs the Comprehensive Adult Student Assessment System, part of the National Diffusion Network. She has worked in ABE and ESL for 15 years, serving as a teacher, counselor, and program director.

Rickard is interested in evaluation of the effectiveness of CAI and CMI software now being used in adult literacy programs, and in computer integration into instruction.

GERALD SEDGWICK *is a volunteer computer consultant for the* **Second Start Literacy Program** *in Oakland, California. This program, run by the* **Oakland Public Library**, *recruits and trains volunteers to tutor adult non-readers, one-on-one, in literacy skills. The program is based on Laubach materials, but uses other materials and methods, including CAI. Sedgwick has written programs to practice spelling for Laubach Way to Read (LWR) Skill Books 1-4, and set up a system for practicing other LWR skills, especially phonics, with accompanying audio tapes. He is now working on a management program for adult literacy projects.*

Sedgwick is interested in management of CAI, including record-keeping aimed at effective reporting. He also is interested in good comprehension development programs.

KIM SPENCER is the director of **Literacy Volunteers of the Central Southern Tiers** of the **Civic Plaza Corning Public Library** in Corning, New York. This program provides individualized instruction to adults above the age of 16 who read at a minimal level or who are learning English as a second language.

DEBORAH STEDMAN *is an education specialist in adult education for the* **Texas Education Agency Division** *of* **Adult and Community Education** *in Austin, Texas. The Agency allocates federal and state monies to local programs, monitors local programs, and provides technical assistance. The Agency develops innovative project specifications for local projects, encouraging adaptation and adoption of technology for instruction through those specifications. Projects have been funded in ABE, ESL, program management, and special populations. Stedman has provided awareness training at the local level, and facilitates statewide dissemination of information on computer use. She also serves on a state technology use task force.*

Stedman wants to explore creative ways of financing hardware and software purchases on a local level, research on computers in literacy instruction, and ways to cause the development of adequate software availability.

THOMAS G. STICHT is the president of **Applied Behavioral & Cognitive Sciences, Inc.** (ABCS) in San Diego, California. ABCS provides teacher, book, and computer-based instruction in adult basic skills and job technical skills. Sticht is recognized for his research into the use of conventional and computer-assisted basic skills programs. He served at the National Institute of Education (NIE) and as director of the basic skills division of HUMRRO. He is known for his work in job-functional literacy skills and has won awards for his work from UNESCO and the U.S. Department of Education.

Sticht is interested in ways of teaching math to adults so they can use it in social, business, and work contexts. He also is interested in adult-oriented basic skills assessment.

ANTONIA STONE *is the executive director of* **Playing to Win** *in New York, New York. Playing to Win's mission is to promote and assist in the implementation of educational computer programs for socially or economically disadvantaged people in the New York City area. Its technical assistance services are available nationally. Stone is a founder of the Boston Computer Access Council, a broad-based group of educators, business leaders, and other citizens concerned with facilitating access to computers for disadvantaged persons in that city.*

Stone is interested in alternatives to CAI in adult literacy programs, and literacy instruction for non-English speakers who are illiterate in their native languages. She wants to know about directions for software development, literacy funding, and sources of vocational educational software.

ELLEN TICHENOR is the executive director of the **Community Women's Education Project** (CWEP) in Philadelphia, Pennsylvania. CWEP is affiliated with the Community College of Philadelphia but is an independent, non-profit organization. Its purpose is to empower women to improve the quality of their lives, through pre-college, college, and employment training focusing on the special needs of low-income women. Its neighborhood technology project offers computer literacy while pursuing an Associate of Arts degree. Tichenor is on a

national task force on computers and education as part of a Fund for the Improvement of Postsecondary Education (FIPSE) project.

Tichenor is interested in the development of critical thinking skills. This area interests her more than CAI per se; software addressing critical thinking would involve simulations in which students would be presented with problems with more than one solution. She is also interested in networking with people who have used computers in creative ways in addressing the poor.

TERILYN C. TURNER *is the center manager for the* **Technology for Literacy Center** *(TLC) in St. Paul, Minnesota. TLC is part of the St. Paul Public Schools' Community Education Department. Its purpose is to improve the literacy level of adults in the St. Paul area through technology. It also trains teachers, administrators, graduate students, and volunteers to incorporate technology in their programs; researches the use of technology in basic literacy instruction; and provides incentive grants to existing literacy programs to stimulate the use of technology. Turner planned and designed TLC as well as the ABLE Center in Charlotte, North Carolina, and has been involved in planning literacy projects in a variety of settings. She is a member of the Adult Literacy and Computers Conference Advisory Committee.*

ANDY TYSKIEWICZ is the director of **Field Services** of the **Literacy Volunteers of Connecticut** (LVC) in Hartford, Connecticut. LVC is a private, non-profit organization that offers one-to-one instruction to youths and adults in basic reading skills and ESL.

Tyskiewicz is interested in the management of CAI, establishing a network among non-profit organizations, and exploring how local affiliates can use CAI for instruction and data collection.

LYNNE A. WEIKART *is the data management coordinator for the* **Literacy Assistance Center** *(LAC) in New York, New York. LAC is an independent, non-profit organization whose mission is to promote the expansion of effective literacy instruction in New York City. It does not operate classes or tutoring programs, but rather supports the institutions, public and private, that provide literacy services, and strengthens the links among them. Weikart developed the data collection and management system for literacy providers in the New York City. She serves on the Adult Literacy and Computers Advisory Committee.*

RUTH WEINSTOCK is a special consultant to the **Business Council for Effective Literacy** (BCEL) in New York, New York. The BCEL is a non-profit organization that promotes business involvement in the national literacy effort. Weinstock has an extensive background in education and technology, and has written numerous articles on both. She serves on the Adult Literacy and Computers Advisory Committee.

RICHARD WENN *is a program director for the* **Educational Products Information Exchange (EPIE) Institute** *in Water Mill, New York. This institute is funded by the Ford and Carnegie Foundations to evaluate educational software and hardware. EPIE publishes a directory of all educational computer software from kindergarten through university-level. Wenn, who is based in California, is working on program which enables grade school children to take computers to their homes as a means of involving in their learning efforts while increasing the family's computer literacy.*

CHRISTOPHER ZACHARIADIS is the executive director of the **Association for Community-Based Education** in Washington, D.C. This association, through its affiliates, seeks to reach and teach adults at lower educational achievement levels. Zachariadis is known for his extensive knowledge of national community-based programs and his support for local concerns.

Technical representatives

A panel of technical representatives was invited to offer their observations on conference discussions. Part of the session was devoted to responding to participants' questions regarding industry's role in using technology to address literacy concerns.

Twelve representatives of hardware, software, and book publishing firms attended the conference as resources to the participants. These individuals were asked to inform the participants about emerging technologies and products that may influence the use of computers in adult learning environments. They also had the opportunity to get consumer reaction to the products available in the area of adult literacy.

Firms represented included **The Adult Education Company, Computer Curriculum Corporation, International Business Machines Corporation, John Wiley & Sons Publishers, Literacy Volunteers of America, EMS/McGraw Hill Book Publishers, Milliken Publishing Company, New Readers Press, Steck-Vaughn Company, Sunburst Communications,** and **USSA/Control Data Corporation.**

A panel of six representatives offered their observations on the issues discussions held during the afternoon of the first day. Three points were made:

-- a lack of consensus on desired outcomes and definitions of such concepts as access and quality exists.

-- a definition of "good instruction" as far as its outcome is needed, as well as a closer dialogue between the profession and the publishers representing the adult literacy clientele is needed. This would lead to more precise product specifications for publishers to follow when developing software.

-- the need for more realistic understanding among consumers regarding cost of the development, marketing, and dissemination processes. When those costs can be offset by the potential market, a mutually beneficial relationship between vendors and practitioners can be established.

Pointing out that the objectives of literacy providers, software publishers, and hardware manufacturers are basically the same, Robert O'Dell, director of software publishing at EMS/McGraw Hill Book Publishers, noted that differing motives for each of these groups lead to a sense of frustration on everyone's part. With better communication among the groups, however, the goal of effective means of teaching literacy should be achieved.

[illegible]dication

Demonstrations of software were offered by conference participants and invited guests. Technologies represented included a voice synthesizer, the Discourse system, interactive video, microcomputers (CDC Viking 110, Apple IIe, MacIntosh, IBM), video cassette recorders, and tape recorders. Also, an explanation of the TLC data collection system was presented. Organizations demonstrating included 3M/Wilder Foundation, Minnesota Educational Computer Consortium (MECC), ABLE (Charlotte, North Carolina), the Northwest Regional Educational Laboratory, Pennsylvania State University, the Literacy Volunteers of the Central Southern Tiers, and the TLC.

TLC is an adult literacy center operated by the St. Paul Public Schools. It utilizes technology in all phases of instruction, as well as conducting research into the effects of technology on literacy instruction.

Issues discussions

In the first of two one-hour sessions, participants, led by a moderator, explored one of six issues which they had identified in materials submitted prior to the conference. The six topics were--

- -- **quality software**
- -- **low-level software (0-4 grades)**
- -- **technology**
- -- **instructional effectiveness**
- -- **management**
- -- **access**

Each discussion was guided by a list of questions about the topic and its role in adult literacy.

In the second session, participants were asked for recommendations for resolution of problems associated with the issue, as well as a brief statement of the outcome of the discussion.

The option of attending both sessions on a single issue or switching from one issue to another was given.

(Each session was led by a moderator who guided his or her group by attempting to address the issue questions, listed in these reports. Notes were taken on each of the sessions, also. These statements represent a summarization of the session notes and comments recorded on flip charts by the moderators. Each summary begins with a brief statement of the issue, the questions used by the moderator to guide the discussion, and a statement of goals and recommendations, which represents the consensus of the group as to what needs to be done to address the issue.

In writing these summaries from the notes available, it often seemed that some form of organization other than that suggested by the issue questions arose. This is reflected by the presence of questions within the text; those questions are the outline of the summaries as they emerged.)

Quality software

Without software, computers don't work. There is a shortage of educational software in general; that shortage is acute when only software addressing adult literacy is considered. Identifying good software through evaluation based on agreed-upon criteria, sharing that information, determining the appropriate use of software addressing different skills with students, and influencing the design and development of software that specifically addresses adult learners are some of the concerns that must be addressed.

ISSUE QUESTIONS:

What is "quality software" and how can it be developed?
a. What are the criteria by which software is evaluated?
b. What quality software is currently in use?
c. How can information about quality software be shared among practitioners?
d. How can practitioners influence the development of software?

GOALS AND RECOMMENDATIONS:

It is necessary to develop quality software that enhances adult learning, the instructional process, and promotes maximum learner control and flexibility.

Basic questions of the needs of adult learners permeate discussion of any method of instruction; the novelty of computer-assisted instruction demands consensus on the best uses of the technology to serve these needs. The roles of students, educators, and vendors in the creation, marketing, and use of quality software are of paramount importance, but are clearly in a state of development in this area. Before technology can be exploited to its full potential, a commitment on the part of

the educational profession to its use as a teaching tool is necessary. That commitment, however, will demand an assessment of basic tenets of educational processes -- how people teach as well as what and why they are teaching will need to be scrutinized.

Several areas of concern emerged during the discussion of quality software, including research into the effects of different software, evaluation of software, development and marketing of software products, and communication about software.

What research exists or is being done on computer instruction in the field of literacy?

Preliminary to discussion of the quality of any software on the market, the expectations of technology in education must be established. While taking advantage of existing literature on the way that adults learn, pilot projects, local applications, and other experimentation can provide the vehicles to produce the results that will fuel and guide the literacy efforts in this country. Empirical research programs can test the effectiveness of technology and aid in defining what accomplishments can be hoped for by using technology. Specific agenda items for research programs include criteria for effective software, identification of the unmet needs of adult learners, what types of software are successful with adults, and the effectiveness of the homegrown software that exists in nooks and crannies around the country.

How is software evaluated?

Evaluation of homegrown software as well as software developed by established vendors of educational programs is the means by which standards of quality can be set. The objectives of quality software are, of course, to enhance adult learning and the instructional process. The design of software programs to include learner control and flexibility are seen as essential to achieving this quality.

Examples of good software do exist currently, and these programs are in use at various sites. The availability of software programs has led to the creation of several consortia whose raison d'etre is software evaluation. Organizations such as the Region X Software Consortium, The Network, Inc., and Literacy Volunteers of the Southern Tiers, provide models of evaluation.

Agreement on the criteria for quality software for adults is essential to a coherent development of the adult literacy field. These criteria must be specific to adult learners, not simply transferred from the K-12 curricula that have enjoyed the majority of resources devoted to literacy and computer-assisted instruction.

The utility of software will come from an affirmative answer to whether it teaches something of value to the adult learner. Once that basic criterion is met, questions of ease of use, the ability to copy the program to insure its practical applications both in a learning center and at home, and flexibility as exemplified by branching and multiple entry and exit points can be addressed. The role of the teacher and the supplemental nature of computer-assisted instruction has to be kept in mind. And, finally, attention to the needs of the adult learner through adult- and family-oriented programs will enable more successful participation in society on the part of students.

What is being done in the areas of R&D and marketing?

The producer of software for adult learning is a term in the equation for teaching literacy whose importance is increasingly recognized. With the absence of dialogue with the users of their software, producers find themselves facing investment in a nebulous market. They, too, suffer from the lack of research into the most effective methods for utilizing computer-assisted instruction. Indeed, they are unsure even of the size of the market being addressed, and the viability of software in reaching that market. The consensus called for in areas of research and evaluation is essential to eliciting the investment needed to produce the quality software being called for. Practitioners will be able to influence the development and testing of software by translating their knowledge and research base into criteria for quality software, effectiveness of technology in instruction, and the potential market.

The scope of that influence will address the paucity of commercially developed software for adults and the need to differentiate software for juveniles from software for grown-ups. Specific needs of programs that target adult learners are the simulation of oral adult language and literacy within the program, realistic applications of skills to the lives of adult learners, and recognition of the often sporadic nature of contact adults have with a program, as well as the the strength of interactive software as a means of involvement. The importance of sound instructional design in all of this transcends the instructional method being used.

How can communication between these groups be improved?

The weak lines of communication between practitioner and vendor are representative of a problem among practitioners. The poorly developed channels of communication within the adult literacy community has led to the ignorance of models of effective use and evaluation on the part of many, as well as an inability to address issues such as teacher training in computer-assisted instruction. The establishment of a framework so that dialogue can continue is the vital element for the dissemination of and access to information on all areas of adult literacy. Such a dialogue would be accomplished by a communication program that would address the implementation and application of software to adult literacy education, and would be ongoing and self-supporting.

What specific recommendations can be offered to resolve this issue?

Focusing on adding adult literacy to the government's policy agenda at legislative levels is necessary to provide the stable funding base necessary for the support of the research and development outlined in these discussions.

A successful communication system among educators and practitioners would provide a model for software developers and producers, who would benefit from such a system of communication by preventing duplication of software and the concomitant waste of resources. Users of software also need an inexpensive and readily accessible source of information on quality software and application to the literacy needs of adults. Linkages among consortia and groups that analyze and review software are desirable.

Software for levels 0-4

The concerns mentioned in the explanation of quality software apply to software for levels 0-4, also. However, the low-level learner presents special challenges for software designers. Given that a substantial share of students participating in adult literacy programs enter those programs operating at low levels, it is important that these challenges, e.g., lack of keyboarding skills, inability to read instructions, the need for oral language, be addressed to provide the basics necessary for the student's progress.

ISSUE QUESTIONS:

What software is effective for low-level readers?

a. What quality software is currently being used in literacy instruction?

b. How should software be integrated with other materials in the curriculum?

c. What software/hardware is needed for low-level readers?

d. How can information about quality software for low-level readers be shared among practitioners?

GOALS AND RECOMMENDATIONS:

The development of basic and life skills computer software designed for independent use with low-level adult education learners should be promoted.

While recognizing that cost effectiveness is often at odds with cost in the literacy market, there are desirable characteristics in any

software developed for learners at levels 0-4. Development of new software should include the following:

Software should reach many people. One way of ensuring this is development of software that doesn't need keyboarding for the learner who has not yet reached the level of skill to manipulate a keyboard. Recognition of the necessity for an audio component at these levels is an essential component that has largely been ignored in the past.

The availability of practice software -- software that is written in a way that it can be modified or supplemented by the instructor or student -- would be helpful to literacy providers working without ready-made software programs or who want to go beyond what that software offers.

Communication among practitioners using low-level software as well as between users and vendors is vital. Practitioners' input in the development and evaluation of software is important to ensure the integration of these characteristics in the design of low-level software.

Three areas of action emerged:

1. The creation of a network of practitioners and vendors who are concerned with development of low-level software is necessary. This network will be a means of identifying and tapping into existing resources in the literacy area that are presently underutilized. Higher institutions of learning are an example of a resource that could be mobilized to participate in literacy programs.

2. A cooperative relationship with the vendors and developers of low-level software, including more input in the evaluation of software will be fostered. Information about how instructors of low-level literacy skills evaluate the effectiveness of software will be supplied to these groups. For example, whether software can serve an adult beginning reader is a basic criterion for assessing a low-level program. Vendors must bear this in mind when developing or selecting low-level software for marketing. The presence of an adult literacy representative on an advisory board of companies developing literacy products to determine whether low-level software will be developed and marketed would provide a needed link between vendor and practitioner.

Other cooperative measures will include clearly defining for vendors the skills to be addressed by low-level software. Sites will be available to vendors as a means of evaluating the effectiveness of software programs in a field situation.

3. A public relations campaign to convince vendors that a viable market for the development of more low-level software does exist will be undertaken. Data to support this claim will be gathered, as well as informing vendors of existing software that meets the criteria for effective and stimulating material.

The result of these activities will be software that addresses the needs of the adult learner by teaching life and coping skills as well as basic literacy, the needs of the practitioner by providing the means to impart that knowledge, and the needs of the software publisher by creating a product that can be useful and profitable.

Technology

Technology and hardware are issues because of their impact on instructional delivery and program cost. New technologies, such as voice synthesizers, interactive video, and other peripherals, and how user-friendly they are impact on computer-assisted instruction. The question of price and where to obtain funding to stay abreast of technological developments is an issue. The overriding concern, however, is how to fully utilize technology in a learning environment, how to "see beyond the box" in which the computer is contained, to its full instructional potential.

ISSUE QUESTIONS:

How can technology's unique instructional capacities be best applied in literacy instruction?

a. What technologies are currently being used for literacy instruction?

b. How can voice synthesizers, interactive video and other technologies be used appropriately for instruction?

c. How can literacy providers share information about the use of technology?

d. What funding sources can be tapped?

GOALS AND RECOMMENDATIONS:

Based on research, experience and field testing, the outcome of technology will--

1. allow the individual to tailor his/her instruction.

2. be applicable in group situations.

3. be easily accessible in a wide variety of settings.

4. become a natural component of a learning program.

5. be time effective and cost effective.

Four interest groups concerned with the issue of technology emerged from this discussion: students, teachers, producers, and the public.

What are the effects of technology on students?

Students, while not all positive about working with technology at the beginning of the experience, quickly lose their fear of computers. They perceptively see computers as a status symbol and refer to going to a "computer class" rather than a "literacy class." This socialization to technology dispels the novelty of the technology; it ceases to be different or innovative and, instead, becomes an accepted part of learning. When it is as convenient for students to use technology as it is for them to use books, issues such as integration of technology into the system of learner needs can be addressed in a more comprehensive way.

What are the effects of technology on teachers?

The next interest group, educators, has the interests of the learners to consider, as well as an agenda that is exclusive to their profession. Resistance to changing educational techniques to accommodate technology is a serious problem that threatens to undermine any effort in this area; however, this resistance springs from fear resulting from a lack of knowledge. Adequate training would alleviate this fear, and would move teachers from forcing those peers already involved in computer-assisted instruction (CAI) to justify the method to cooperating in exploring ways to increase effectiveness of technology. Many teachers are willing to experiment with technology on their own. These efforts at innovation would be facilitated by the recognition that, as in all areas, time equals money. A commitment on the part of educators and administrators to technology will encourage its integration into the educational system.

What are technology's effects on its producers?

Producers have the overriding question of cost effectiveness facing them. Adult education historically has not been a profitable venture; literacy as a subunit of it is even more fragmented, especially under current conditions. A clear definition of the market that will be addressed is vital information for vendors considering investing in it.

On the other hand, educators using computer technology believe there are few developers listening to the stated needs in this area. Manifestations of this communication breakdown include the lack of standardization of hardware and software, and the entry on the market of technology that is designed to sell rather than to advance the field. There must be input from professionals to guide development in computer technology to change the current situation in which producers may inappropriately be prescribing the shape of the market.

Technology now encompasses much more than computers. Interactive video is providing a unique learning opportunity in a limited number of settings; voice synthesizers provide an integral element in effective instruction; robotics is a fascinating possibility in a teaching situation. The rapid entry into the market of new technologies offers exciting possibilities, but also raises the concern of how an educator can hope to stay abreast of these innovations. Most find themselves struggling to keep up, much less

stay on the cutting edge. The dizzying replacement of old technology with new brings dealing with obsolescence to the fore. While cost effectiveness is an important consideration for producers trying to bring a product into the market, it is just as important for the purchaser who is usually operating under serious budget constraints.

What are the effects of technology on the public?

All of the problems of students, teachers, and producers are reflected in the problems of the public in addressing the issue of technology. A fear of technology exists because of value systems that hesitate to embrace it, and a lack of knowledge that will persist until everyone has had exposure to it. The bottleneck in integration of technology is neither the software nor the hardware so much as it is human limitations. Technology has been presented as the means to make the world perfect; such hyperbole is justifiably unaccepted by most people. However, the public needs to know that technology can be applied to adult literacy in innovative and effective ways. Until the field can catch the public's interest, the diversion of necessary resources from other areas to adult literacy will not occur.

Public support, then, becomes the key to attaining the goals that emerged from this discussion. Improved teacher training, fundamental to this endeavor, will be achieved only when public policy focuses on providing funding to enable it. Then the identification of literacy skills people need and the strategies to teach those skills will be possible. The research that will evaluate where technology is going and what impact it will have on adults will be accomplished when the money is available. The same is true for providing universal access to technology, be it in learning centers or in public libraries and shopping malls. Access to information in the form of data bases is another goal.

In the meantime, programs are moving ahead with technology. The call for the institution of changes in the teaching process, curricula, educational organizations, and government policies with regard to technology is being answered tentatively now. A commitment to technology in literacy on the part of students, educators, business, and the public will permit a strong, concerted effort in this area.

Instructional effectiveness

Instructional effectiveness is at the heart of education. The use of computers in teaching literacy skills raises special problems and concerns. Curriculum design that takes advantage of the computer's unique capacities, as well as the response of students are parts of the issue of the instructional effectiveness of computers.

ISSUE QUESTIONS:

How can technology be utilized to provide excellent literacy instruction?

a. What is the impact of computer-assisted instruction on the learner?

b. How can computer-assisted instruction be integrated with other materials in the curriculum?

c. How should/can progress be measured?

d. How are the staff training needs of a computer-assisted literacy program different?

e. How can practitioners share information about computer-assisted literacy curricula?

GOALS AND RECOMMENDATIONS:

A research program is needed to determine the impact of effectiveness of computers in adult learning. Research needs to include a description of the use of computers and address these issues:

1. Are students becoming independent learners?

2. Does measurement include affective as well as cognitive domains?

3. Is measure of achievement based on individual learner's goals?

4. Does the measurement

cover the range of possibilities of CAI?

5. What are the alternatives to CAI?

The effectiveness of using computers to teach literacy to adults emerges as the pivotal issue in any discussion about the use of microcomputers in teaching adult literacy. Research does exist that addresses this issue, but replication and improved dissemination of extant research on the impact of computers is called for. Once the impact is understood, implementation of the means of assuring the best use of computer technology can begin.

Evaluation of effectiveness has largely focused on the elementary and secondary education levels. This focus needs to be expanded to include the adult learner to gain a clear understanding of the effects of computers and their uses in that context. Computer instruction itself needs to be better defined -- does this refer to any situation in which computer technology is used to instruct, or are there other criteria that must be met? Subgroups exist within this classification, e.g., ESL, survival skills, basic skills, and GED preparation.

What is the impact of the computer on the adult learner?

The question of how computers affect a learner needs to be addressed. Whether instruction via computer appeals primarily to the cognitive domain of a student, to his affective domain, or to both is an important consideration in trying to use this process most effectively. The importance of the affective and resultant empowerment of the learner presents a potential for computer instruction that must be explored and tapped, if possible.

How can the computer be integrated with other materials?

Finding the most effective way to integrate the computer with other teaching materials is a necessary component of a comprehensive research program. Such integration must be designed with the learner's needs in mind. This would lead to an emphasis on teaching autonomy and the ability to transfer skills learned in a classroom to situations outside the center. The avoidance of dependence on the part of the learner on the computer as evidenced by being able to apply skills and concepts learned via computer to other learning media, e.g., cassette tapes or printed materials, that are easily found and used outside a formal learning setting, is desirable. All of these approaches contribute to independent learning, which is the best way to serve learners' needs.

How can instructional effectiveness be measured?

The quantification of what constitutes the effective means to independent learning is a task that will require a creative approach to research design.

Indicators of independent learning, such as reading a book in the last three months, would facilitate research in an experimental/control group setting. Other vital data include measurement of programs that are in place.

Student participation in determining measurement programs is seen as a powerful tool for involvement, preferable to a passive role as mere subjects of measurement. What to measure elicited suggestions that reading levels and goal-setting abilities are important aspects for assessment, as well as the effects on the affective and cognitive domains.

Questioning the effects that past research has had on the literacy field pointed to the need for research that explores the full range of possibilities of using computers to teach literacy, while recognizing that there may be situations and students for whom the computer is not the best method of delivery of instruction. The needs of the student dictate that measurement and evaluation be as integral a part of any program as are development and implementation. However, to be most effective, this research will have to deal with the difficulty of studying literacy instruction. Definitions will have to be formulated in some cases, refined in others, but as the field is now defined, it is too encompassing to provide means of gaining valid results.

What are the staff training needs?

Existing programs that utilize computers have identified several problems with the training of staff

to gain the maximum instructional effectiveness. The amount of time needed to integrate this instructional design into a curriculum has been underestimated. Changes in the process of instruction demand a change in training to give instruction. With time and increased acceptance of computers, these problems will diminish in importance; nevertheless, they are germane now and must be addressed.

What needs to be done to resolve this issue?

To date, no real statement with a nationwide scope as to the effectiveness of instruction through computers has emerged. The variables from program to program have precluded this; however, the absence of such a statement should not blind people to the opportunity offered by technology to revitalize the instructional process.

Management

Management of literacy programs using the same equipment intended for instruction are natural complements. Management issues such as staff training, promotion of computer instruction among professional communities, budget and fiscal management, linkages and networking, and public relations and outreach topics fall under the purview of literacy program management. The question of how these issues can improve instructional effectiveness in classrooms and tutoring situations is important. Data collection and analysis are primary management needs that are facilitated by use of computers, and can lead to effective tracking of students and volunteers and to matching them for optimal learning situations.

ISSUE QUESTIONS:

How can computers support effective management systems for literacy programs?

a. What utilities exist that can effectively manage records, student progress, and reporting for programs?

b. What utilities need to be developed that will provide for effective management of literacy programs?

c. What is the appropriate use of the computer in management functions?

d. How can management functions be standardized for better communication among programs?

GOALS AND RECOMMENDATIONS:

The following goals were agreed upon:

-- Share common definitions of success
-- Share procedures
-- Develop a model
-- Share management techniques
-- Share management tools/systems
-- Share funding resources
-- Find ways to negotiate with funders
-- Facilitate access to necessary resources

Management of programs rarely enjoys the same limelight as other, perhaps more compelling aspects of adult literacy. Yet effective management provides the environment required for success. Several tools of management that contribute to effective programs were discussed, including allocation of resources, but the focus of attention was measurement -- what it is, what is being measured, whom it serves, and its role in learning.

What is measurement?

Acknowledging the difficulty of measuring certain things (e.g., success of ESL at beginning levels), several prerequisites for a functional approach to measurement emerged.

Common definitions of the dimensions of literacy are essential. Until agreement on what "success" in literacy means is reached, the validity of results is subject to question. Are the things being measured valid and reliable indicators of what needs to be measured? Who is interested in these measurements, and what impact will they have?

Measuring for whom?

Three groups have a vested interest in the findings of measurement efforts in literacy programs, and each group has widely differing agenda in which the results will figure.

Funders of programs require feedback on the cost effectiveness of their contributions; students need to measure their own progress and are interested in the efficiency of the program in which they are participating; programs themselves must utilize all information available to improve teaching personnel, methods, and materials, and to maximize the cost effectiveness of every piece of financing they receive.

This information is available only if someone gathers it. What is gathered and who gathers it are of prime concern if the time and personnel used in the measurement process are being pulled away from some other area of a program. The efforts are cost effective only if the data collected is pertinent to the goals of the program, and if the methods used to gather the information insure that it serves the needs of the three groups interested in it.

Measuring what?

Relevant types of information include gains data -- how well is a program doing in achieving its goals? To measure goals, it is important that they be stated. Is it a program's goal that its students obtain jobs? If so, does a student who drops out after 20 hours of instruction to take a job represent a failure because he didn't finish the entire course and perhaps didn't reach a specified reading level, or is he a success by virtue of gaining employment? Or is it important that students advance in their current jobs? Or that they vote in an election? The need for common measures of success is obvious.

Demographics of students are common measures gathered in literacy programs. How do they serve each of the three interested groups? How can demographics be used to improve a literacy program, reach more potential learners or better serve the current ones, or present a case for increased funding to a financial supporter?

There is also a constant collection of data being accomplished through records on student progress. Using these data for program as well as student evaluation is a means of stretching your data dollar.

How does measurement help or hinder the learning process?

The question of efficiency is important when looking at who is gathering information. The allocation of resources comes into play in considering how much data must be gathered and how expensive it is to gather in terms of time spent by program personnel. Time also becomes an issue for a first-time student who faces a painfully long intake screening.

How can we improve the management of literacy programs?

Several ideas for improving the management of programs and information emerged from the discussion. Specific techniques, such as using matrix instead of universal sampling in data collection, and computerizing this as well as student progress record-keeping as ways of streamlining the measurement process, were suggested. Manipulating data so it can be utilized to satisfy different program needs while negotiating assertively and thoughtfully with funders on what information is necessary for their funding process, why that information is needed, and if those needs can be prioritized and limited is desirable.

The most compelling data that most programs have to offer deal with the progress of students. To provide this type of information, more innovative techniques are needed for measuring gains. This and other objectives that were raised in these sessions can be addressed

by increased sharing of information about management tools, systems, and processes that have been used successfully in one program or another. A grass roots effort utilizing existing organizations such as the Coalition for Literacy, LitLine (part of SpecialNet) and ADVOCNET or modeling itself on the Region X Software Consortium (Alaska, Idaho, Oregon, and Washington) would exploit existing relationships and information as a way to cut costs. A national conference where hands-on opportunities to explore the resources being used at programs around the country is one means of facilitating this interchange.

Access and equity are important considerations in assuring that the learners who are most in need and least likely to participate are served by computers. Many poor urban and isolated rural communities may be unable to establish computer-assisted literacy programs because of the cost of the technology and the availability of trained staff. While serving these areas and individuals is a federal priority, the role of computers in literacy must be examined in light of the basic concerns regarding access.

ISSUE QUESTIONS:

How can access be assured in computer assisted literacy programming?

a. Is access a problem?

b. Are literacy programs receiving equal access to computer assisted programming?

c. How can this problem be addressed?

d. Are special populations (e.g., learning disabled, hearing impaired) best served by computer?

GOALS AND RECOMMENDATIONS:

Further discussion on the definition of access and the extent to which it is a problem in literacy programs is needed.

Whatever aspect of using computers to teach literacy skills is under discussion, when taken to its limits, access will always be the destination. In a societal setting where the concept of equity is mocked by the existence of "haves" and "have-nots," it is feared that computers will provide but another element in an already skewed formula.

This concern surfaced again and again during the discussion of the issue of access. Problems in access with other technological innovations were noted -- should everyone now have access to a telephone? If so, is universal access to computers a logical extension of that belief? The prevalence of computer technology in our society is such that availability of technology to all may soon prove to be necessary.

How does using computers to teach literacy impact on questions of access?

There are components and levels of access to computer technology that bear on the problem in different ways, and these will be influenced by the philosophy of education that guides the use of computers as educational tools. Whether the computer will be the core of a curriculum or a complement to the teacher is an important consideration in determining the need for access at the level of the individual learner and at the level of the learning center. Software as well as hardware must be available. Information that aids in using the technology is a must, as well as the basic training that enables students to access that information.

What are the obstacles to universal access?

The availability of technology does not insure that the opportunity to use it exists for the learner. Obstacles, mundane and grand, exist. A question such as

child care to free students to visit computer technology sites must be considered. Psychological barriers to using technology, such as a fear of it and uncertainty as to one's ability to learn to use it must be addressed. Attitudes toward technology that do not lead to its embrace due to cultural differences, gender biases, or philosophical questions about its role in one's life are constraints that color the issue of access.

For the learning center, whatever form it takes, the question of cost effectiveness is essential. If an organization believes it should provide as wide access as possible, it must determine how to fund such an effort. The cost of equipment is perhaps the most easily understood obstacle to access that emerged from the discussion. Access will vary from program to program,depending on the economic realities under which each operates. The time involved in establishing access to computer technology is a real consideration in terms of training staff and students. The availability of technical assistance for staff charged with keeping technology operating has proved to be a stumbling block on occasion. Even the issue of security comes into play.

The question, then, is how can access to technology be assured for all literacy students capable of using and benefitting from it? The pie-in-the-sky goal for literacy specifically and society in general is that all individuals have their own computers, know how to use them, and be linked to other individuals in a way that maximizes learning and participation free of all of the obstacles that have been outlined. That will entail philosophical acceptance of computer technology on the part of both student and teacher.

On a larger scope, the question boils down to, can it be expected that those who have power now will allocate resources that will, in all likelihood, provide the means to chip away at their power base? Public awareness may provide an impetus for this sort of action, but it will have to be a strong push.

How do we achieve universal access?

Practical steps seen as moving us toward this goal included locating computers where they'll be used, for example, in libraries and shopping centers; having computers available for loan to individuals; providing training in how to use computers; more research into software; insuring that the information people need is available via computer; facilitating networking; encouraging cooperative use arrangements between businesses and learners so technology will be used 16 hours a day instead of only eight; developing certifiable programs that can be completed via computer, providing an alternative to attending vocational schools; and utilizing the good software that exists while informing developers and producers of what is appropriate and valuable in tapping the potential of computers in literacy.

Status and opportunities in this society are largely based on access to technology. Computers play an important role in the ability to communicate; they enable manipulation of knowledge in ways that facilitate different ways of thinking. It has been shown to allow special groups, such as the handicapped, to accomplish things that were not formerly possible. Denial of access to technology and these concomitant benefits will reinforce and enlarge an existing "outsider" group -- those who cannot hope to attain a level of empowerment that computer technology would permit.

Conversation

Bill Speights, a representative from IBM, offered the preliminary results of his investigation into literacy. Speights was charged by IBM to look into the problem of adult literacy and IBM's role in addressing that problem. He emphasized that IBM has made no formal commitment to literacy, but is interested in exploring how to best serve people working in the literacy field.

Focus on the Future

Wilson Learning's Innovator, a computerized system customized to group needs, was presented to the participants. The Innovator has been used extensively the Fortune 500 businesses in varied settings, and was used at this conference to attempt to prioritize the recommendations coming out of the discussions of the issues of the previous day. It appears that effective use of the Innovator process was handicapped by inadequate involvement of participants prior to and during the application of the system. The time constraints of the conference forced a rushing of the Innovator process; dissatisfaction with the applicability of the information being gained through the process caused resistance on the part of some participants to carrying the activity through to its completion. Instead, participants probed the issues further, and offered more issues for consideration.

General steps for further action and conference follow-up were made by the participants at large, followed by each participant indicating what activities he or she would be interested in pursuing and what resources could be offered.

Next Steps

At the close of the conference, participants were asked to indicate what effect the conference had had and would have on them and their programs, and what they could contribute to insure that the initiative begun at Spring Hill would continue. The following is a listing of those comments. They have been structured in the following way: first, the individual-level effects identified; next, ways to facilitate the interaction among individuals, perhaps best characterized by the word "networking"; third, efforts at research to support the field of adult literacy in general; and finally, the development of the field itself. Some comments will mention specific agencies represented at the conference.

Individual

-- *a better understanding of the range and potential (or lack of potential) of technology for literacy training.*

-- *increased commitment to move ahead with what my organization is already doing.*

-- *examination of new directions for our computer curriculum.*

-- continued adaptation of our program.

Networking

-- serve as a resource for identifying policy issues and policy choices for other participants.

-- share the resources available through my program with other participants.
-- make information available to other sites with no complaints.

-- *report on this conference in our newsletter.*
-- *attempt to increase the dialogue with publishers' representatives concerning adapting existing basic education software for use in adult learning programs.*
-- *network on a local level.*

-- be in closer touch with other literacy agencies in Philadelphia.
-- share information about this conference with Chicago Library members.
-- seek opportunities for sharing information through volunteer networks, newsletters, and conferences.

-- *disseminate this conference's results and information to other librarians.*
-- *report to a state agency on the conference.*
-- *rethink the role of the Division of Adult Education in supporting the emerging network of computer users in adult literacy.*

-- share what I've learned here with local, state and national organizations with which I work.
-- share information nationally and regionally, particularly with the employment and training groups we work with.
-- share information regarding this meeting with the American Library Association staff.

-- *focus on increasing national awareness of the adult literacy issue, especially among national groups such as the Chamber of Commerce, associations, unions, etc.*
-- *provide EPIE as a forum to continue discussion of adult literacy software.*
-- *provide EPIE's resources to exchange public domain software among practitioners.*

-- distribute information through LITLINE.
-- link up with LITLINE.
-- establish a link with LitLine for all consortium agencies.

-- *inform to the CASAS Consortium information on the software currently being used successfully at TLC, ABLE, and Region X.*
-- *stay in contact with CASAS.*
-- *find out what software development is being done within LVA affiliate systems and set in motion a process for evaluation, development, and dissemination of quality grass-roots developed programs.*

-- get involved in a software consortium.
-- choose an issue about which I will contact participants for more information and ideas through inexpensive, small meetings and workshops.
-- get more information from participants.

-- *follow up with at least 10 people I met here.*
-- *maintain contact with new people I met at this conference; they are invaluable resources.*
-- *increase contact with other practitioners in this area.*

Research

-- make my program site available for field testing.
-- test software.
-- engage in data collection and analysis.

Development of The Field

-- act as an advocate for the interests of this group.
-- look at how to integrate new options for identifying, utilizing, and integrating available software and hardware into the design of educational delivery systems.
-- encourage increased use of technology for management and instruction.

-- *initiate ideas and information acquired at this conference to improve quality and effectiveness of literacy instruction via technology.*
-- *solicit participation in development of integration of technology in literacy instruction by as many programs as are interested.*
-- *identify resources from the community that can assist in implementation of technology in adult literacy programs.*

-- explore how to make better use of volunteers.
-- create a task force on technology to advise staff and volunteers on a continuing basis.

-- start a state task force on technology.

-- *encourage sponsoring a similar event in Texas.*
-- *plan a national workshop for librarians.*
-- *begin to work on a computer conference addressing one of the issues discussed here and drawing on conference participants as the primary resources for that conference.*

-- plan a national conference dealing with access and networking issues.
-- help to design an electronic conference for people interested in adult literacy.
-- pull together statewide delivery information in moving toward a national data base.

-- *encourage establishing a separate bulletin board on Technology and Literacy on LitLine.*
-- *work toward reaching a consensus in New York City on software needs and how to use new technologies to develop such software.*
-- *tie EPIE into evaluating adult literacy software.*

-- look at developing problem-solving software for use in reading instruction.
-- focus more on creating problem-solving and critical thinking exercises to use with generic software.
-- work on developing a software loan library to enable hands-on previewing.

-- *work on creating a standardized list of information regarding evaluation of software and hardware.*
-- *work on establishing a curricular exchange.*
-- *explore the development of management issues and an action plan.*

-- encourage the development of a management system for literacy programs.
-- explore using resources to attain technology and programming expertise.
-- identify groups willing to field test new technology.

-- *complete the LITMAS project, taking into account the feedback received at this conference.*
-- *conduct a comprehensive review of the use of technology for my staff.*
-- *integrate writing, word processing, and adult education into staff development.*

-- write a staff manual on integrating computers into a curriculum.

Future of Software

The Adult Literacy and Computers Conference is the precursor to a much larger national movement. It is viewed as a beginning by the advisory committee, and by its funders. The conference proceedings and their wide dissemination is viewed as a significant contribution in advancing this field. The conference itself is simply a marker, a milestone, on a new and uncharted path.

In the weeks following the Adult Literacy and Computers Conference, correspondence and phone calls indicated that major changes were occurring among the participants and in the literacy network throughout the country. Contacts established during the conference were maintained and extended to include vendors contacting participants to evaluate software and serve on company software review committees; joint proposal-writing by participants; regional conferences and newsletters; and networking on a wide range of technology issues. Still needed, however, was a means to formalize the national network and provide guidance for action in all of the areas addressed during the issues discussions at the conference.

Immediately after the conference, the advisory committee met to assess the value of the experience and decide on the next steps. It was agreed that the conference had achieved many of its objectives, but had not been able to produce the definitive action plan that had been anticipated.

At the direction of the advisory committee, several conference participants who had indicated great interest in assisting in larger planning efforts, were invited to return to St. Paul, Minnesota, for a one-day meeting. The purpose of the meeting was to expand the literacy initiative begun at the conference by developing a plan to address the need for an ongoing communication network. The purpose of the network will be to support the development and use of technology in adult literacy programs, applying technology's unique capabilities to provide solutions for the national problem of functional illiteracy.

The adult literacy and technology network will be charged with the responsibility of creating a national communication system with the following objectives:

1. To meet the need of literacy programs for information and sharing of experience to further the use of technology and to prevent isolation.

2. To set up a system to review and disseminate software information in adult literacy programs.

3. To develop a plan for adaptation of existing software and development of new materials.

4. To create and develop training packages to assist literacy providers in instruction and management.

5. To provide technical assistance to literacy programs.

6. To encourage research by matching resources, and supporting funding for the application of technology in literacy programs.

7. To project and direct futures in the areas of computers, television, video, and interactive video.

8. To track developments in technology for their application to the field of adult literacy.

It is hoped that funding can be secured to support such expansion and that all recipients of conference proceedings will be partners in planning and sharing the sense of mission begun at the Adult Literacy and Computers Conference. Readers of these proceedings are asked to become part of a national movement by committing themselves to the goals of the Adult Literacy and Computer Conference:

1. To support the development of computer use in adult literacy programs, applying the computer's unique capabilities to the areas of management and instruction, and providing solutions for the national problem of functional illiteracy.

2. To create an effective dissemination system which will provide ready access to information on computers and other forms of technology, including selection of hardware and software, training, curriculum design, funding, evaluation, and organizational recommendations for adult literacy programs.

[illegible] addresses

BULKELEY, CHRISTY
Gannett Foundation
Lincoln Tower
Rochester, NY 14604
(716) 262-3315

CLAUSEN, BOB
Oregon Department of Education
700 Pringle Parkway S.E.
Salem, OR 97320
(503) 378-8560

HAMMINK, JEAN
B. Dalton Bookseller
7505 Metro Boulevard
Minneapolis, MN 55435
(612) 893-7661

TURNER, TERILYN C.
Technology for Literacy Center
580 University Avenue
St. Paul, MN 55103
(612) 222-4464

WEIKERT, LYNNE
Literacy Assistance Center
15 Dutch Street, 4th Floor
New York, NY 10038
(212) 267-5309

WEINSTOCK, RUTH
Business Council for Effective Literacy
1221 Sixth Avenue
New York, NY 10020
(212) 512-2415

RAY, KAREN
Karen Ray Associates
425 South Upton Avenue
Minneapolis, MN 55405
(612) 377-2128

[illegible] addresses

ANDERSON, PATRICIA A.
Martinez Adult School
600 F Street
Martinez, CA 94553
(415) 228-3276

ARENZ, JOHN T.
Route 1, Box 80 Bowman Lake Road
Cass Lake, MN 56633
(218) 751-5271

ARNSMEYER, ELLEN
Lakes County Rehabilitation Center
2626 West College Road
Springfield, MO 65802
(417) 862-1753

ASKOV, EUNICE N.
Institute for Study of Adult Literacy
171 Chambers Building
University Park, PA 16802
(814) 865-2430

BARTHOLOMEW, CAROLE
The Northern Institute
650 W. International Airport Road
Anchorage, AK 99518
(907) 563-3174

BUCKLEY, ELIZABETH A.
Clover Drive Adult Center
105 Clover Drive
Great Neck, NY 11021
(516) 482-8650, Ext. 617

CHURCH, LINDA
Laubach Literacy Action
1320 Jamesville, Box 131
Syracuse, NY 13210
(315) 422-9121

COLEMAN, JEAN
American Library Association
50 E. Huron
Chicago, IL 60611
(312) 944-6780

CROSS, MARY
U.S. Department of Education
400 Maryland Avenue S.W.
Room 4145
Washington, DC 20202
(202) 732-2970

CROUCH, JINX
Literacy Volunteers of America, Inc.
404 Oak Street
Syracuse, NY 13203

DELKER, PAUL
400 Maryland Avenue S.W.
Reporters Bldg., Room 522
Washington, DC 20202-5515
(202) 732-2270

DOWLING, GAIL
Vermont Institute for Self-Reliance
Box 66
East Calais, VT 05650
(802) 456-8837

DUFFY, TOM
Communication Design Center
Carnegie-Mellon University
160 Baker Hall
Pittsburgh, PA 15213
(412) 268-8701

EISELSTEIN, JUNE
Mary H. Weir Public Library
3442 Main Street
Weirton, WV 26062
(304) 748-7070

EWER, GALE
Massachusetts Department of Education
Greater Springfield Reg. Ctr.
88 Massasoit Avenue
West Springfield, MA 01089-1199
(413) 739-7271

FLEISCHMAN, JOHN
La Puente Valley Adult Schools
Hall of Justice
211 W. Temple, Room 208
Los Angeles, CA 90012
(213) 974-5096

HAGEMEYER, RICHARD
Central Piedmont Community College
P.O. Box 35009
Charlotte, NC 28235
(704) 373-6566

HERNANDEX, MARIA IMPINK-(TORI)
15555 Wilson Boulevard
Rosslyn, VA 22209
(800) 336-4560

HOLZNAGEL, DONALD
Computer Technology Program
Northwest Regional Laboratory
300 S.W. 6th Avenue
Portland, OR 97204
(503) 248-6800

JOHNSTON, CYNTHIA WILSON
Central Piedmont Community College
P.O. Box 35009
Charlotte, NC 28235
(704) 373-6716

LAIDLEY, JANE NISSEN
PCC, Inc.
2682 Bishop Drive, Suite 107
San Ramon, CA 94583
(415) 830-4200

LANE, MARTHA A.
Volunteer Reading Aides
Lutheran Church Women
2900 Queen Lane
Philadelphia, PA 19129-1091
(215) 438-2200

LAUGHARN, ELIZABETH
400 Maryland Avenue S.W.
FOB #6, Room 4145
Washington, DC 20202
(202) 732-4014

LAVIN, RICHARD J.
Merrimack Education Center
101 Mill Road
Chelmsford, MA 01824
(617) 256-3985

LERCHE, RENEE S.
The Network, Inc.
290 S. Main Street
Andover, MA 01810
(617) 470-1080

LINDBERG, JAMES S.
California State
Department of Education
721 Capitol Mall
Sacramento, CA 95814
(916) 323-2564

MacDONALD, LUCY TRIBBLE
Chemeketa Community College
P.O. Box 14007
Salem, OR 97309
(503) 399-5256

McCALLISTER, DUANE K.
Hattiesburg Education
Literacy Project
P.O. Box 1111
Hattiesburg, MS 39401
(601) 582-4321

ORNSTEIN, LYNNE
The Fortune Society
39 W. 19th Street
New York, NY 10011
(212) 206-7070

PARKER-MILLER, DONNA
Renton Vocational Institute
3000 N.E. 4th Street
Renton, WA 98056
(206) 235-2391

PIERCE, W. LEE
Hattiesburg Education
Literacy Project
P.O. Box 5154
Hattiesburg, MS 39406
(601) 266-4621

POLLAK, RICHARD A.
MECC
3490 Lexington Avenue N.
St. Paul, MN 55112
(612) 481-3670

RABIDEAU, DANIEL
Literacy Assistance Center
15 Dutch Street
New York, NY 10038
(212) 267-5309

RICKARD, PATRICIA
CASAS Project
6165 Syracuse Lane
San Diego, CA 92110
(619) 230-2975

SEDGWICK, GERALD
Second Start Literacy Program
125 14th Street
Oakland, CA 94612
(415) 273-3432

SPENCER, KIM
Civic Plaza Corning
Public Library
Corning, NY 14830
(607) 936-3713

STEDMAN, DEBORAH
Texas Education Agency
1701 N. Congress
Austin, TX 78701
(512) 463-9447

STICHT, THOMAS G.
Applied Behavioral &
Cognitive Sciences, Inc.
P.O. Box 6640
San Diego, CA 92106
(619) 225-6911

STONE, ANTONIA
Playing to Win
106 E. 85th Street
New York, NY 10028
(212) 650-0229

TICHENOR, ELLEN
Community Women's
Education Project
Frankford Ave. and
Somerset Street
Philadelphia, PA 19134
(215) 426-2200

TYSKIEWICZ, ANDREW
Literacy Volunteers of
Connecticut
576 Farmington Avenue
Hartford, CT 06105
(203) 236-5466

WENN, RICHARD
EPIE Institute
P.O. Box 839
Water Mill, NY 11970
(516) 283-4922
(707) 833-4621 (in California)

ZACHARIADIS, CHRISTOPHER P.
Association for Community
Based Education
1806 Vernon Street
Washington, DC 20009
(202) 462-6333

Technical representatives' addresses

EISENBERG, CHUCK
Milliken Publishing Company
1100 Research Boulevard
St. Louis, MO 63132
(314) 991-4200

KOSCHNICK, KAY
Senior Editor
New Readers Press
Division of Laubach
Literacy International
1320 Jamesville Ave., Box 131
Syracuse, NY 13210
(315) 422-9121

KOSEL, MARGE
Vice President
Sunburst Communications
Room Y 5
39 Washington Avenue
Pleasantville, NY 10570
(914) 769-2292

LAWSON, VIRGINIA
Director of Publishing
and Marketing
Coordinator of Research
and Development
Literacy Volunteers of America
404 Oak Street
Syracuse, NY 13203
(315) 474-7039

LESURE, ALLEN
Vice President
Occupational Division
John Wiley and Sons
605 Third Avenue
New York, NY 10155
(212) 850-6707

O'DELL, ROBERT
Director of Software Publishing
EMS/McGraw Hill
9855 W. 78th Street
Eden Prairie, MN 55344
(612) 829-8200

PFISTER, LINDA
John Wiley and Sons
2107 Majestic Oak Circle
St. Cloud, FL 32769
(305) 892-2603

RIDLEY, WILLIAM J.
Vice President
Academic Programs
ademic Programs
USSA/CDC
Box 0
8100 34th Avenue South
Minneapolis, MN 55440
(612) 853-4734

SOMERFIELD, BENITA
President
Cambridge, The Adult
Education Company
888 Seventh Street
New York, NY 10106
(212) 957-5300

SPAIN, CECIL
President
Steck-Vaughn Company
P.O. Box 2028
Austin, TX 78768
(800) 531-5015

SPEIGHTS, BILL
Manager
IBM
P.O. Box 2150
Atlanta, GA 30055
(404) 238-2000, Ext. 5621

WALLACE, MARY
Marketing Representative,
Midwest Region
Computer Curriculum
Corporation (CCC)
1070 Arastradero Road
Palo Alto, CA 94304-0812
(800) 227-8324

Software used by participants

Conference participants were asked to list five software programs of their choice. The form they used to list and describe the way they use the software is included for clarification. There was no attempt to place an instructional or management value on the usefulness of the software. They are listed as presented and placed in alphabetical order for convenience. The names of participants who listed the material are included should a personal contact be desired. To more easily understand the level of use, please note the classification types, defined as follows:

Type I -- Functionally illiterate adults who have educational needs below the level equivalent to fourth-grade completion when such needs constitute a substantial impairment of their ability to get or retain employment, who have incomes below the poverty level, and are unemployed or are considered "unemployable." Adults in this priority group often need one-to-one AB/CE in their home or another non-threatening spot, and may be able to participate in, and benefit from, AB/CE only when their transportation, child care, health, nutrition, counseling, and/or other support service needs also are addressed.

Type II --Functionally illiterate adults who have educational needs below the level equivalent to eighth-grade completion, have low incomes, are unemployed, and are not included in #1. Adults in this category often speak a language other than English or a non-standard dialect of English. They may persevere in AB/CE programs that are based on their individual interests and needs, rather than on a fixed curriculum, but may require one-on-one tutoring before participating in group work. People in this category often want to enter job training programs or apprenticeships as soon as possible (rather than go to a post-secondary school).

Type III --Functionally illiterate adults who have educational needs below the level equivalent to eighth-grade completion, who have below average incomes,and who are not included in #1 or #2. People in this category may be unemployed, underemployed, seasonally employed, or have "blue collar" overtime or swing-shift work. They usually need learning centers with flexibile hours, child care, and other services in order to participate in AB/CE, and may benefit from alternative programming such as television broadcasting when individual tutoring also is available.

Type IV --Functionally illiterate adults who are not included in #1, #2, or #3. Less in need, and easiest to reach and teach, people in this category often are employed or keep house and raise families, usually take advantage of libraries and courses that interest them, and can easily complete an adult high school diploma or general educational development preparation course, or succeed through options that emphasize self-directed, independent learning such as correspondence or televised courses.

The Conference Advisory Committee expresses its appreciation to the participants for their contributions. For additional information on software analysis/-reviews with adult literacy as a prime focus, contact the following organizations:

Merrimack Education Center
101 Mill Road
Chelmsford, MA 01824

ABE Microcomputer
Clearinghouse
Box 5154
Hattiesburg, MS 39406

Region X Adult Education
Software Project
Treaty Oak CCSD
300 East 4th Street
The Dalles, OR 97058

Literacy Assistance Center
15 Dutch Street
New York, NY 10038

Technology for Literacy Center
580 University Avenue
St. Paul, MN 55103

On the form below please describe the five most important pieces of software your program uses. They may be instruction or management related. Write in the name of the software and the publisher, then check the boxes that best describe the software. Typologies for "APPLICATION" and "TYPE OF STUDENT" are attached.

NAME: _____

PROGRAM/ORG: _____

SOFTWARE SUMMARY FORM

SOFTWARE	PUBLISHER	EQUIPMENT	INSTRUCTION														DISCIPLINE								MOST APPLICABLE FOR STUDENT TYPE			
			INSTRUCTION / PROGRAM MGMT																						SEE STUDENT TYPE BELOW SEE TYPOLOGIES			
PLEASE LIST NAME	PLEASE LIST COMPANY	SPECIFY EQUIPMENT INCLUDING HARDWARE, SOFTWARE, PERIPHERALS & ATTACHMENTS	DRILL & PRACTICE	EDUCATIONAL GAME	SIMULATION	DEMONSTRATION	TUTORIAL	PROBLEM SOLVING	OTHER	FISCAL MANAGEMENT	PERSONNEL	EVALUATION	RECORDS	REPORTS	GENERAL OFFICE	READING GRADES 0-6	READING GRADES 7-12	WRITING	MATH	GED	COLLEGE PREP	SURVIVAL SKILLS	ESL	I	II	II	IV
1.																												
2.																												
3.																												
4.																												
5.																												

ALIEN ACTION
Developmental Learning Materials
One DLM Park
Allen, TX 75002
800/527-4747
Description: An Educational Game, Alien Action teaches Reading Grades 0-6 and Writing Skills. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Volunteer Reading Aides, Lutheran Church Women
Contact: -- Martha Lane

ALPHABETIC KEYBOARDING - TYPING TUTORIAL
Southwestern Publishing Company
5101 Madison Road
Cincinnati, OH 45227
513/271-8811
Description: Designed for Drill and Practice, Alphabetic Keyboarding teaches Reading Grades 0-6 and Reading Grades 7-12. It is used with Types I and II students.
Equipment: -- Apple IIe
TRS 80 (disk drive)
Where Used: -- Mary H. Weir Public Library
Contact: -- June Eiselstein

ANALYZING AN AD
MCE, Inc.
157 South Kalamazoo Mall, Suite 250
Kalamazoo, MI 49007
800/421-4157
Description: Designed for Evaluation and General Office, Analyzing An Ad teaches Reading Grades 0-6 and Survival Skills. It is used with Type III students.
Equipment: -- Apple (48K)
Where Used: -- La Puente Valley Adult Schools
Contact: -- John Fleischman

APPLE PRESENTS APPLE
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
408/996-1010
Description: A Tutorial, Apple Presents Apple teaches Reading Grades 0-6. It is used with Type II students.
Equipment: -- Apple IIe (1 or 2 drives)
Where Used: -- Mary H. Weir Public Library
Contact: -- June Eiselstein

APPLEWRITER
Apple Computer, Inc.
(see APPLE PRESENTS APPLE)
Description: Applewriter teaches Reading Grades 0-6, Writing Skills, Survival Skills, and ESL. It is used with Types I, II, and III students.
Equipment: -- Apple
Where Used: -- Adult Education Consortium
Volunteer Reading Aides, Lutheran Church Women
Contact: -- John Arenz, Martha Lane

APPLEWORKS
Apple Computer, Inc.
(see APPLE PRESENTS APPLE)
Description: Designed for Fiscal Management, Personnel, Records, Reports and General Office management, Appleworks also teaches Reading Grades 0-6. It is used with Type III students.
Equipment: -- Apple IIe
Apple IIc
Where Used: -- The Northern Institute
Hattiesburg Education Literacy Project
La Puente Valley Adult Schools
Technology for Literacy Center
Contact: -- Carole Bartholomew, Lee Pierce, Duane McCallister, John Fleischman, Teri Turner

ARITHMETIC CLASSROOM
Sterling Swift
7901 South IH-35
Austin, TX 78744
512/282-6840
Description: A Drill and Practice and Tutorial, Arithmetic Classroom teaches Math Skills. It is used with Type II students.
Equipment: -- Apple IIe (2 drives) and printer
Atari 800 or 1200XL (2 drives) and printer
Where Used: -- La Puente Valley Adult Schools
Contact: -- John Fleischman

ATARI WRITER
Atari
(contact local retailer)
Description: A Drill and Practice, Demonstration, and Tutorial, Atari Writer is designed for Reports and General Office management. Atari Writer also teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, GED, College Preparation, Survival Skills, and ESL. It is used with Types I, II, and III students.
Equipment: -- Apple IIe (2 drives) and printer
Atari 800 or 1200 XL (2 drives) and printer
Where Used: -- Playing to Win
Contact: -- Antonia Stone

BANK STREET WRITER
Scholastic
730 Broadway
New York, NY 10003
212/505-3000
Description: Bank Writer teaches Writing Skills. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe and printer
Where Used: -- Adult Education Consortium
Contact: -- John Arenz

BASIC MATH (SYSTEM H)
Mathware
1020 Manhattan Beach Boulevard
Manhattan Beach, CA 90266
213/546-5895
Description: A Drill and Practice and Tutorial, Basic Math is designed for Evaluation management. Basic Math also teaches Math Skills. It is used with Type III students.
Equipment: -- Apple IIe
Where Used: -- ABLE/CPCC
Contact: -- Cynthia Johnston

BOPPIE'S WORD CHASE
Developmental Learning Materials
(see ALIEN ACTION)
Description: An Educational Game, Boppie's Word Chase teaches Reading Grades 0-6 and Writing Skills. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Renton Vocational Technical Institute
Contact: -- Donna Miller-Parker

CASAS MICRO MANAGAEMENT SYSTEM
CASAS
3249 Fordham Street
San Diego,CA 92111
619/230-2975
Description: CASAS Micro Mathematics System is designed for Evaluation, Records, and Reports management. CASAS Micro Mathematics System also teaches Reading Grades 0-6, Reading Grades 7-12, Math Skills, Survival Skills, and ESL. It is used with Types I, II, III, and IV students.
Equipment: -- IBM PC (256K, 2 drives) and printer (serial and parallel I/O)
Where Used: -- CASAS
Contact: -- Patricia Rickard

CLOZE PLUS
Milliken Publishing Co.
1100 Research Boulevard
St. Louis, MO 63132
314/991-4220
Description: A Drill and Practice, Cloze Plus is designed for Evaluation management. CLOZE Plus also teaches Reading Grades 0-6 and Reading Grades 7-12. It is used with Type III students.
Equipment: -- Apple IIe
Where Used: -- ABLE/CPCC
Contact: -- Cynthia Johnston

COMPREHENSION POWER
Milliken Publishing Co.
(see CLOZE PLUS)
Description: A Drill and Practice and Tutorial, Comprehension Power is designed for Fiscal Management, Records, and Reports management. Comprehension Power also teaches Reading Grades 0-6, Writing Skills, and Math Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple
Where Used: -- Chemeketa Community College (McDonald)
Vermont Institute for Self-Reliance
Renton Vocational Technical Insitute
Contact: -- Lucy Tribble MacDonald, Gail Dowling, Donna Miller-Parker

COMPUTER CONCEPTS
Continuous Learning Corporation
(no information available)
Description: Computer Concepts is a Tutorial. It is used with Type IV students.
Equipment: -- Apple II
IBM PC
Where Used: -- Merrimack Education Center
Contact: -- Richard Lavin

CREATE - FILL IN THE BLANK
Hartley Courseware, Inc.
123 Bridge Street, Box 419
Dimondale, MI 48821
517/646-6458
Description: A Drill and Practice, Create is designed for Evaluation management. Create also teaches any discipline -- the teacher creates the lesson. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe and cassette recorder
Where Used: -- ABLE/CPCC
Contact: -- Cynthia Johnston

CROSSWORD MAGIC
Mindscape (L&S)
3444 Dundee Road
Northbrook, IL 60662
Description: An Educational Game, Crossword Magic teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, Math Skills, and ESL. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe and cassette recorder
Where Used: -- Chemeketa Community College
The Northern Institute
Vermont Institute for Self-Reliance
Contact: -- Lucy Tribble-MacDonald, Carole Bartholomew, Gail Dowling

dBASE II
Apple Corporation, Inc.
(see APPLE PRESENTS APPLE)
Description: A Tutorial and Problem Solver, dBASE II is designed for Evaluation, Records, Reports, and General Office management. dBASE II also teaches College Preparation. It is used with Type IV students.
Equipment: -- IBM PC
Apple IIe
Where Used: -- Community Women's Education Project
Contact: -- Ellen Tichenor

DEC WPS WORDPROCESSING SYSTEM
Digital Equipment Corporation
296 Lafayette Freeway Frontage Road
St. Paul, MN 55107
612/227-7870
Description: WPS Wordprocessing System is designed for Reports and General Office management. WPS Wordprocessing System also teaches Survival Skills. It is used with Types I and II students.
Equipment: -- DEC WT/78
Where Used: -- The Fortune Society
Contact: -- Lynne Ornstein

DRILL
Literacy Volunteers
of The Central
Southern Tiers
Civic Plaza Corning Public Library
Corning, NY 14830
607/936-3713
Description: A Drill and Practice, Drill teaches Reading Grades 0-6. It is used with Types I and II students.
Equipment: -- Commodore 64 (system)
Where Used: -- Literacy Volunteers of the Central Southern Tiers
Contact: -- Kim Spencer

DRIVER'S EDUCATION
Micro-Ed Software
P.O.Box 4440055
Eden Prairie, MN 55344
800/MIC-ROED or 612/944-8750
Description: A Drill and Practice and Simulation, Driver's Education teaches Reading Grades 0-6. It is used with Type II students.
Equipment: -- Commodore 64
Where Used: -- Literacy Volunteers of the Central Southern Tiers
Contact: -- Kim Spencer

E-Z PILOT
Hartley Courseware, Inc.
(see CREATE)
Description: A Drill and Practice and Tutorial, E-Z Pilot teaches Reading Grades 0-6. It is used with Types I and II students.
Equipment: -- Apple IIe (professional system)
Where Used: -- Lakes Country Rehabilitation Center
Contact: -- Ellen Arnsmeyer

EL*LIXIR
I Soft
(no information available)
Description: An Educational Game and Problem Solver, El*Lixir teaches Reading Grades 0-6 and Reading Grades 7-12. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

ESSENTIAL IDIOMS
Regents ALA
Two Park Avenue
New York, NY 10016
212/889-2788
Description: A Drill and Practice, Essential Idioms teaches ESL. It is used with Type II students.
Equipment: -- Apple II
Where Used: -- Merrimack Education Center
Contact: -- Richard Lavin

THE FACTORY
Sunburst Communications
39 Washington Avenue, RM VF414
Pleasantville, NY 10570
800/431-1934
Description: An Educational Game and Problem Solver, The Factory teaches Survival Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Adult Education Consortium
Contact: -- John Arenz

THE FRIENDLY COMPUTER
MECC
3490 Lexington Avenue
St. Paul, MN 55112-8097
Description: A Drill and Practice and Tutorial, The Friendly Computer teaches Reading Grades 0-6. It is used with Type III students.
Equipment: -- Apple IIe
Apple IIc
Where Used: -- Hattiesburg Education Literacy Project
Contact: -- Lee Pierce

GED PREPARATION SERIES, MATH, READING, WRITING SKILLS
Intellectual Software
798 North Avenue
Bridgeport, CT 06606
800/232-2224
Description: A Drill and Practice, the GED Prepration Series teaches Reading Grades 7-12, Writing Skills, Math Skills, GED, and College Preparation. It is used with Types III and IV students.
Equipment: -- Apple IIe
Where Used: -- Adult Education Consortium
Contact: -- John Arenz

HARDER & HARDER
Playing to Win
106 East 85th Street
New York, NY 10028
212/650-0229
Description: A Drill and Practice, Harder & Harder is used with Types I, II, and III students.
Equipment: -- Commodore Pet
Commodore 64
Atari
Where Used: -- Playing to Win
Contact: -- Antonia Stone

HARTLEY VOCABULARY
Hartley Courseware, Inc.
(see CREATE)
Description: A Drill and Practice, Hartley Vocabulary is designed for Evaluation management. Hartley Vocabulary also teaches Reading Grades 0-6. It is used with Type I students.
Equipment: -- Apple IIe
Apple II+
Where Used: -- Technology for Literacy Center
Contact: -- Teri Turner

HI TECH
(no information available)
Description: Hi Tech teaches Reading Grades 0-6, Reading Grades 7-12, and Writing Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple (1 or 2 drives) and printer
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

HOSTS DATA BASE
Hosts Corporation
(no information available)
Description: Designed for Records management, Hosts Data Base also teaches Reading Grades 0-6. It is used with Types III and IV students.
Equipment: -- Apple IIe (1 or 2 drives) and printer
Where Used: -- Renton Vocational/Technical Institute
Contact: -- Donna Miller-Parker

I.C.T. MATH
I.C.T.
10 Stepar Place
Huntington Station, NY 11746
516/549-3000
Description: A Drill and Practice and Tutorial, I.C.T. Math is designed for Evaluation management. I.C.T. Math also teaches Math Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Technology for Literacy Center
Contact: -- Teri Turner

IDEA INVASION
Developmental Learning Materials
(see ALIEN ACTION)
Description: An Educational Game, Idea Invasion teaches Reading Grades 0-6 and Writing Skills. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Renton Vocational/Technical Institute
Contact: -- Donna Miller-Parker

INSTANT WORDS
Jamestown Publishers
P.O. Box 6743
Providence,RI 02940
401/351-1915
Description: A Drill and Practice, Instant Words teaches Reading Grades 0-6. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Renton Vocational/Technical Institue
Contact: -- Donna Miller-Parker

LANGUAGE/READING DEVELOPMENT
(no information available)
Description: A Drill and Practice and an Educational Game, Language/Reading Development teaches Reading Grades 0-6 and Writing Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple
Where Used: -- Vermont Institute for Self-Reliance
Contact: -- Gail Dowling

LASCAI, LANGUAGE SKILLS CAI
U.S. Navy
(no information available)
Description: A Drill and Practice, Educational Game, Tutorial, and Problem Solver, LASCAI is designed for Records and Reports management. LASCAI also teaches Reading Grades 7-12 and Math Skills. It is used with Type III students.
Equipment: -- IBM PC (256K, monochrome monitor)
Where Used: -- U.S. Navy
Contact: -- Thomas Sticht

LESSON CREATE
Hartley Courseware, Inc.
(see CREATE)
Description: Lesson Create addreses Reading Grades 0-6. It is used with Type III students.
Equipment: -- Apple II
Where Used: -- Merrimack Education Center
Contact: -- Richard Lavin

LETTER RECOGNITION
Hartley Courseware, Inc.
(see CREATE)
Description: A Drill and Practice, Letter Recognition teaches Reading Grades 0-6. It is used with Type III students.
Equipment: -- Apple IIe
Apple IIc
Where Used: -- Hattiesburg Education Literacy Project
Contact: -- Lee Pierce

LOGO
Apple Computer, Inc.
(see APPLE PRESENTS APPLE)
Description: A Simulation and Problem Solver, LOGO teaches Reading Grades 0-6, Reading Grades 7-12, Math Skills, GED, College Preparation, and ESL. It is used with Types I, II, and III students.
Equipment: -- Atari
Where Used: -- Playing to Win
Contact: -- Antonia Stone

LOTUS 1-2-3
Lotus Development Corporation
161 First St.
Cambridge, MA 02142
Description: An Educational Game, Tutorial, and Problem Solver, Lotus 1-2-3 is designed for Fiscal Management, Records, and Reports management. Lotus 1-2-3 also teaches Math Skills and College Preparation. It is used with Type IV students.
Equipment: -- IBM PC 5150 (256K) and Epson printer
Where Used: -- Literacy Volunteers of Connecticut
Community Women's Educational Project
Contact: -- Andy Tyskiewicz, Ellen Tichenor

MAGIC SLATE
Sunburst Communications
(see THE FACTORY)
Description: Magic Slate teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, and Survival Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIc (2 drives) and printer
IBM (2 drives) and printer
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

MAKE LIST/USE LIST
Literacy Volunteers
of The Central
Southern Tiers
(see DRILL)
Description: A Drill and Practice and Tutorial, Make List/Use List teaches Reading Grades 0-6. It is used with Types I and II students.
Equipment: -- Commodore 64
"Simon Basic"
Where Used: -- Literacy Volunteers of The Central Southern Tiers
Contact: -- Kim Spencer

MAKING CENTS
The Fortune Society
39 W. 19th Street
New York, NY 10011
212/206-7070
Description: A Drill and Practice and Educational Game, Making Cents teaches Reading Grades 0-6, Reading Grades 7-12, College Preparation, and Survival Skills. It is used with Types I, II, and III students.
Equipment: -- Commodore Pet with cassette drive
Where Used: -- The Fortune Society
Contact: -- Lynne Ornstein

MASTER TYPE
(no information available)
Description: A Drill and Practice and Educational Game, Master Type teaches Reading Grades 0-6, Reading Grades 7-12, College Preparation, and Survival Skills. It is used with Types I, II, and III students.
Equipment: -- Apple IIe (2 drives)
Atari 800 or 1200XL (keyboarding graphics)
Where Used: -- Playing to Win
Contact: -- Antonia Stone

MATH
Milliken
(see CLOZE PLUS)
Description: Designed for Records and Reports management, Math teaches Math skills.
Equipment: -- Apple
Where Used: -- Vermont Institute for Self-Reliance
Contact: -- Gail Dowling

MATH ACTIVITIES COURSEWARE, LEVEL 4
Houghton-Mifflin
One Beacon Street
Boston, MA 02107
617/725-5000
Description: A Drill and Practice, Educational Game, Tutorial, and Problem Solver, Math Activities Courseware teaches Math Skills. It is used with Types I, II, and III students.
Equipment: -- Apple IIe
Where Used: -- Adult Education Consortium
Contact: -- John Arenz

MATH SAFARI
Micro-Ed Software
(see DRIVER'S ED)
Description: A Drill and Practice and Educational Game, Math Safari teaches Math Skills. It is used with Types I, II, and III students.
Equipment -- Commodore Pet with cassette drive
Where Used: -- The Fortune Society
Contact: -- Lynne Ornstein

MECC #731, VOL. #7 - ALPHABET, COUNTING, MEMORY, ETC.
MECC
(see THE FRIENDLY COMPUTER)
Description: A Drill and Practice, Educational Game, and Tutorial, MECC #731 teaches Reading Grades 0-6, Math Skills, and ESL. It is used with Types I and II students.
Equipment: -- Apple IIe
Where Used: -- Adult Education Consortium
Contact: -- John Arenz

MECC WRITER
MECC
(see THE FRIENDLY COMPUTER)
Description: MECC Writer teaches Writing Skills. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe and printer
Where Used: -- Adult Education Consortium
Contact: -- John Arenz

MILLIKEN ARTS
Milliken Publishing Company
(see CLOZE PLUS)
Description: A Drill and Practice and Tutorial, Milliken Arts teaches Writing Skills. It is used with Types II, III, and IV students.
Equipment: -- Apple II
Where Used: -- The Northern Institute
Contact: -- Carole Bartholomew

MILLIKEN COMPREHENSION POWER
Milliken Publishing Company
(see CLOZE PLUS)
Description: A Drill and Practice, Milliken Comprehension Power is designed for Reports management. Milliken Comprehension Power also teaches Math Skills. It is used with Type III students.
Equipment: -- Apple (48K)
Where Used: -- La Puente Valley Adult Schools-Correctional Education Division
Contact: -- John Fleischman

MILLIKEN MATH
Milliken Publishing Company
(see CLOZE PLUS)
Description: A Drill and Practice, Milliken Math is designed for Reports management. Milliken Math also teaches Math Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple II
Where Used: -- The Northern Institute
La Puente Valley Adult Schools-Correctional Education Division
Merrimack Education Center
Contact: -- Carole Bartholomew, John Fleischman, Richard Lavin

MILLIKEN READING
Milliken Publishing Company
(see CLOZE PLUS)
Description: A Drill and Practice and Tutorial, Milliken Reading teaches Reading Grades 0-6 and Reading Grades 7-12. It is used with Types I, II, III, and IV students.
Equipment: -- Apple II
Where Used: -- The Northern Institute
Contact: -- Carole Bartholomew

MISSING LINKS ENGLISH EDITOR
Sunburst Communications
(see THE FACTORY)
Description: Missing Links English Editor teaches Reading Grades 0-6, Reading Grades 7-12, and ESL. It is used with Type III students.
Equipment: -- Apple II
Where Used: -- Merrimack Education Center
Contact: -- Richard Lavin

MULTIPLE CHOICE
(no information available)
Description: Multiple Choice teaches Reading Grades 0-6, Reading Grades 7-12, and Writing Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe and printer
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

PFS PACKAGE
Software Publishing Corporation
P.O. Box 50575
Palo Alta, CA 94303
Description: PFS Package is designed for Fiscal Management, Personnel, Evaluation, Records, Reports, and General Office management.
Equipment: -- Apple IIe (2 drives) and printer
Where Used: -- Volunteer Reading Aides, Lutheran Church Women
Contact: -- Martha Lane

PFS WRITE
Software Publishing Corporation
(see PFS PACKAGE)
Description: A Drill and Practice, Demonstration, and Tutorial, PFS Write is designed for Reports and General Office management. PFS Write also teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, GED, College Preparation, Survival Skills, and ESL. It is used with Types I, II, and III students.
Equipment: -- Apple IIe (2 drives) and printer
Atari 800 r 1200XL (2 drives) and printer
Where Used: -- Playing to Win
Contact: -- Antonia Stone

PIECE OF CAKE MATH
Springboard
7807 Creekridge Circle
Minneapolis, MN 55435
800/328-1223
Description: A Drill and Practice, Springboard teaches Math Skills. It is used with Type III students.
Equipment: -- Apple IIe
Apple IIc
Where Used: -- Hattiesburg Education Literacy Project
Contact: -- Lee Pierce

PLATO BASIC SKILLS AND GED
Control Data Corporation
P.O. Box 261127
San Diego,CA 92126
800/233-3784
Description: A Drill and Practice, Demonstration, and Tutorial, PLATO is designed for Evaluation management. PLATO also teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, Math Skills, and GED. It is used with Types II, III, and IV students.
Equipment: -- CDC Viking 110
Where Used: -- Technology for Literacy Center
ABLE/CPCC
Contact: -- Teri Turner, Cynthia Johnston

THE POND
Sunburst Communications
(see THE FACTORY)
Description: A Problem Solver, The Pond teaches Reading Grades 0-6 and Writing Skills. It is used with Types I and II students.
Equipment: -- Apple IIe
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

PREFIX PACK
MECC (Sunburst Communications)
(see THE FRIENDLY COMPUTER)
Description: A Drill and Practice and Tutorial, Prefix Pack is designed for Evaluation management. Prefix Pack also teaches Reading Grades 0-6. It is used with Type III students.
Equipment: -- Apple IIe
Where Used: -- ABLC/CPCC
Contact: -- Cynthia Johnston

PRINT SHOP
Broderbund
17 Paul Drive
San Rafael, CA 94903
415/479-1170
Description: A Drill and Practice, Print Shop teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, and Survival Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple II+
Apple IIc
Apple IIe
Apple III (emulation mode)
Where Used: -- PCC, Inc.
Playing to Win
Chemeketa Community College
Mary H. Weir Public Library
Contact: -- Jane Nissen Laidley, Antonia Stone, Lucy Tribble MacDonald, June Eiselstein

PRIVATE TUTOR
IBM
P.O. Box 1329
Boca Raton, FL 33432
800/IBM-2468
Description: A Drill and Practice, Educational Game, Stimulation, Demonstration, Tutorial, and Problem Solver, Private Tutor teaches Reading Grades 7-12 and Math Skills. It is used with Type III students.
Equipment: -- IBM PC (256K and monochrome monitor)
Where Used: -- U.S. Navy
Contact: -- Thomas Sticht

PROFILE III+
Radio Shack
(contact local retailer)
Description: Profile III+ is designed for Personnel, Records, and Reports management.
Equipment: -- Radio Shack TRS 80 III or IV and printer
Where Used: -- CASAS
Contact: -- Patricia Rickard

ROBOT ODYSSEY
(no information available)
Description: A simulation and Problem Solver, Robot Odyssey teaches Reading Grades 7-12. It is used with Types III and IV students.
Equipment: -- Apple II
Where Used: -- Community Women's Education Project
Contact: -- Ellen Tichenor

SMARTCOM
Hayes
5923 Peachtree Industrial Blvd.
Norcross, GA 30092
Description: A Demonstration and Problem Solver, Smartcom teaches College Preparation.
Equipment: -- IBM PC with modem and printer
Where Used: -- Community Women's Education Project
Contact: -- Ellen Tichenor

SOFTSWAPS
CUE (public domain)
(no information available)
Description: A Drill and Practice, Educational Game, Simulation, and Problem Solver, Softswaps teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, Math Skills, and ESL. It is used with Types I, II, III, and IV students.
Equipment: -- Apple
Where Used: -- Vermont Institute for Self-Reliance
Contact: -- Gail Dowling

SPEEDREADER
(no information available)
Description: A Drill and Practice and Educational Game, Speedreader teaches Reading Grades 7-12. It is used with Type III students.
Equipment: -- IBM PC (256K, monochrome monitor)
Where Used: -- U.S. Navy
Contact: -- Thomas Sticht

SPEEDSCRIPT
Computer Gazette Software
(no information available)
Description: A Drill and Practice, Speedscript is designed for Personnel, Records, Reports, and General Office management. Speedscript also teaches Reading Grades 0-6, Reading Grades 7-12, Writing Skills, Math Skills, GED, College Preparation, Survival Skills, and ESL. It is used with Types I, II, III, and IV students.
Equipment: -- Commodore 64
Where Used: -- Literacy Volunteers of The Central Southern Tiers
Contact: -- Kim Spencer

SPELL IT
Hartley Courseware, Inc.
(see CREATE)
Description: Spell It teaches Reading Grades 0-6 and Writing Skills. It is used with Type I students.
Equipment: -- cassette connect device
Where Used: -- Chemeketa Community College
Contact: -- Lucy Tribble MacDonald

SPELLING
The Fortune Society
(see MAKING CENTS)
Description: A Drill and Practice, Spelling teaches Reading Grades 0-6 and Writing Skills. It is used with Type I students.
Equipment: -- Commodore Pet, cassette drive
Where Used: -- The Fortune Society
Contact: -- Lynne Ornstein

STECK-VAUGHN SPELLING
Steck-Vaughn
P.O. Box 2028
Austin, TX 78768
Description: A Drill and Practice, Educational Game, and Tutorial, Steck-Vau Spelling teaches Reading Grades 0-6 and Reading Grades 7-12. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Technology for Literacy Center
Contact: -- Teri Turner

SUPER PILOT
(no information available)
Description: Super Pilot teaches Reading Grades 0-6, Survival Skills, and ESL. It is used with Types I and II students.
Equipment: -- Apple IIe and printer
Where Used: -- Volunteer Reading Aides, Lutheran Church Women
Contact: -- Martha Lane

SUPERSCRIPT
Radio Shack
(contact local retailer)
Description: Designed for Records and Reports management, Superscript teaches Reading Grades 7-12. It is used with Type IV students.
Equipment: -- Radio Shack TRS 80, Model 4 (2 drives) and DMP-210 printer
Where Used: -- Mary H. Weir Public Library
Contact: -- June Eiselstein

SUPERSCRIPT
Apple Computer Corporation
(see APPLE PRESENTS APPLE)
Description: Designed for Evaluation, Records, and Reports management, Superscript also teaches Reading Grades 0-6. It is used with Type I students.
Equipment: -- Apple IIe (2 drives, color monitor) and printer
Where Used: -- Penn State University--Institute for The Study of Adult Literacy
Contact: -- Nikki Askov

SYMPHONY
Lotus
(see LOTUS 1-2-3)
Description: Symphony is designed for Fiscal Management, Records, Reports, and General Office management.
Equipment: -- IBM PC
Where Used: -- CASAS
Contact: -- Patricia Rickard

TECHNOLOGY TRANSFER PROJECT, LASCAI MONEY MANAGEMENT
Department of Defense and
National Commission on
Libraries and Information
Science
(no information available)
Description: A Drill and Practice and Tutorial, LASCAI Money Management teaches Reading Grades 0-6. It is used with Type IV students.
Equipment: -- Apple IIe (2 drives)
Where Used: -- Mary H. Weir Public Library
Contact: -- June Eiselstein

TEST BANK PROGRAM
Advanced Technology Applications
(no information available)
Description: Test Bank Program is designed for Evaluation, Records, and Reports management.
Equipment: -- Radio Schack TRS 80 III or IV
IBM PC
Where Used: -- CASAS
Contact: -- Patricia Rickard

TYPING
The Fortune Society
(see MAKING CENTS)
Description: A Drill and Practice and Tutorial, Typing teaches Survival Skills. It is used with Type II students.
Equipment: -- Commodore Pet, cassette drive
Where Used: -- The Fortune Society
Contact: -- Lynne Ornstein

WIZ WORKS
Developmental Learning Materials
(see ALIEN ACTION)
Description: An Educational Game, Wiz Works teaches Reading Grades 0-6 and Reading Grades 7-12. It is used with Types II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- Renton Vocational/Technical Institute
Contact: -- Donna Miller-Parker

WORD ATTACK
Davidson and Associates
6069 Groveoak Place,#12
Ranchos Palos Verdes, CA 90247
Description: A Drill and Practice, Educational Game, and Tutorial, Word Attack is designed for Reports management. Word Attack also teaches Reading Grades 0-6, Reading Grades 7-12, GED, College Preparation, and ESL. It is used with Types I, II, III, and IV students.
Equipment: -- IBM PC (256K)
Apple IIe
Apple IIc
Where Used: -- Chemeketa Community College
The Northern Institute
Hattiesburg Education Literacy Project
Contact: -- Lucy Tribble MacDonald, Carole Bartholomew, Lee Pierce

WORD MATCH
(no information available)
Description: Word Match teaches Reading Grades 0-6, Reading Grades 7-12, and Writing Skills. It is used with Types I, II, III, and IV students.
Equipment: -- IBM PC and printer
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

WORD PATTERNS
Literacy Volunteers
of The Central
Southern Tiers
(see DRILL)
Description: A Drill and Practice, Word Patterns teaches Reading Grades 0-6. It is used with Types I, II, III, and IV students.
Equipment: -- Commodore 64
Where Used: -- Literacy Volunteers of The Central Southern Tiers
Contact: -- Kim Spencer

WORD PREP/CHALLENGING ANALOGIES
(no information available)
Description: A Drill and Practice and Educational Game, Word Prep/Challenging Analogies teaches Reading Grades 7-12. It is used with Type III students.
Equipment: -- IBM PC (256K, monochrome monitor)
Where Used: -- U.S. Navy
Contact: -- Thomas Sticht

WORD SCRAMBLE
(no information available)
Description: Word Scramble teaches Reading Grades 0-6, Reading Grades 7-12, and Writing Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

WORD SEARCH
(no information available)
Description: Word Search teaches Reading Grades 0-6, Reading Grades 7-12, and Writing Skills. It is used with Types I, II, III, and IV stduents.
Equipment: -- IBM and printer
Apple IIe and printer
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

WORD TALK
Computer Aides Corporation
4929 South Lafayette Street
Fort Wayne, IN 46806
219/456-2148
Description: A Drill and Practice and Tutorial, Word Talk teaches Reading Grades 0-6 and Reading Grades 7--12. It is used with Types I and II students.
Equipment: -- Apple IIe (professional system) and echo + synthesizer
Where Used: -- Lakes Country Rehabilitation Center
Contact: -- Ellen Arnsmeyer

WORDMATCH
(no information available)
Description: Wordmatch teaches Reading Grades 0-6, Reading Grades 7-12, and Writing Skills. It is used with Types I, II, III, and IV students.
Equipment: -- Apple IIe and printer
Where Used: -- PCC, Inc.
Contact: -- Jane Nissen Laidley

WORDSTAR
MicroPro
33 San Pablo Avenue
San Rafael, CA 94903
Description: Designed for Personnel, Reports, and General Office Management, WordStar teaches Reading Grades 7-12, Writing Skills and College Preparation. It is used with Types III and IV students.
Equipment: -- IBM PC with modem and printer
Where Used: -- Community Women's Education Project
Contact: -- Ellen Tichenor

The case for computers

(reprinted with permission from the Business Council for Effective Literacy)

As computers come into widespread use in education, from kindergarten to the university, their role in adult basic education demands attention. Given the large gap between the millions of adults in need of basic literacy skills and the shortage of teachers, tutors, and funds to serve them, the potential of computer-assisted instruction (CAI) clearly needs to be explored. Can computers help to reduce the gap? If so, how? To what extent are they currently being used in adult basic skills programs? For what purposes? With what success? If adult basic education were "computerized," could we affect more people more quickly at equal or lower cost?

BCEL thought it timely to begin looking at these questions, especially as scattered reports from literacy providers relate strong positive experience with the use of computers. To be sure, problems abound in the field, but the initial evidence does suggest that there is a potent, highly significant role for computers in addressing the distinct needs of adult learners.

The Merits

Holding Power. Computers are more than just another tool in the repertoire of instructional technologies. For many users they have a compelling fascination--a "holding power" that makes it difficult to put them aside. Teachers report that children compete for access to them, often staying hours after school to use them. Literacy workers tell of elderly women climbing flights of stairs at a center to practice on them. The appeal of computers is increasing student participation and motivating students to stay with instruction.

Positive Learning Environment. For adult non-literates especially, the computer provides a mode of learning that is untarnished by childlike overtones or the failure associated with their traditional school experiences. The most dramatic results have been with people who have been defeated by other methods and who thus believed that they could not read, write, or learn.

Learning About Computers. Adults who learn basic skills on a computer also learn in the process about computers. The operational techniques absorbed as a by-product of instruction become in themselves marketable skills. These adults stand a better chance of competing for entry-level word processing jobs and job-training programs.

Enhancing Teacher Productivity. Computers can boost teacher productivity in two ways: by improving the ratio of teachers to students and by performing management chores. When students work on computers by themselves, supplementing work given by teachers, teachers are freed to serve more students and to address the students' personal needs and concerns. With the use of computer-managed instruction (CMI), teachers are twice freed: testing, diagnosing, placing students at appropriate levels of instruction, tracking progress, and record-keeping are time-consuming chores efficiently performed by the machines.

Instructional Effectiveness. Another characteristic of the computer is its ability to engender intense concentration. As interactive instruments requiring response by the user, computers produce a high level of task management and they increase attention span. They also provide individualization, self-pacing, and patience. Their capacity to store and retrieve information permits students to interact with material geared to their greatly varied individual levels and rates of speed, and to receive instant feedback. Computers also can repeat the same question endlessly, react without impatience or irritation, and provide the privacy that protects from embarrassment. These features are especially important for illiterate adults. Finally, CAI programs can offer instruction that otherwise would not be feasible. Combined with interactive videodiscs, for example, they can

bring reality to the learning situation. Real-life images and sound can be added to the courseware, making it possible to incorporate vivid examples that show how things being learned fit into the daily lives of students.

Reducing Attrition. Drop-out rates often reflect scheduling conflicts due to job and family duties. With computers available for a portion of the program, rigid scheduling can be eased. If a tutor misses a session or a student has extra time, the student can drop by the literacy center and work independently. This flexibility even makes it possible to offer instruction in locations where teachers are not available at all.

Notable Models

A prime example embodying many of these elements is ABLE, the Adult Basic Literacy/Education program of North Carolina's Central Piedmont Community College. ABLE uses a total of 32 microcomputers at four off-campus learning centers. One is in a shopping mall, another in a neighborhood center, and still another in a mobile van serving church and prison populations. Now in its third year, ABLE has served 1,300 persons. The computerized core curriculum in reading and math rests on the PLATO Basic Skills Learning System developed by Control Data Corporation and the University of Illinois. The curriculum is supplemented by Apple software, print and other media, and work with teachers and tutors. For students at the fourth to eighth-grade reading levels, the computer software constitutes 80 percent of the total instructional package. At these levels, the teacher acts as a guide, facilitating the student's progress through the CAI program. At zero to fourth-grade levels, the weight is on one-to-one tutoring, with the CAI component used for about one-third of the program.

The results show a clear advantage over the traditional classroom or tutoring situation. ABLE students advance an entire reading grade-level in 20 hours. In contrast, it takes 150 hours to achieve this in conventional adult basic education classes at North Carolina's community colleges. "Beyond the actual time saved," notes Central Piedmont's president, Dr. Richard Hagemayer, "consider what it means in terms of incentive. if you're 35 years old with two children, reading at a fourth-grade level, to put in 150 hours you've got to go to a traditional class two nights a week, two hours a night, for 37 weeks. And if you want to qualify for a job training program that requires an eighth-grade reading level, you'd have to go for three years. Compare that with 60 hours."

ABLE administrators credit the success of the achievement rate to the individualization of the program and the intense concentration evoked among students working on the computers.

Another notable model is the U.S. Navy's Wisher-Duffy system, currently being tested at a number of civilian sites, among them the Enoch Pratt Free Library in Baltimore, Maryland, and the Mary H. Weir Library in Weirton, West Virginina. This system, developed for the Navy by cognitive psychologists Robert Wisher and Thomas Duffy, is based on information--processing theories that evolved from research in the 1970s on the nature of the reading process. It improves on presently-available software in significant ways, and has been validated with low-literate naval recruits reading below a sixth-grade level. The recruits improved their reading comprehension in half the time and their vocabulary scores in one-third the time as those conventionally taught, and they retained what they learned about twice as well.

An important pioneering feature of the system is that it enables instructional personnel with no prior knowledge of computers and with a minimum of training to design CAI programs tailored to individual student interests and needs. The "content sensitive" system allows the teacher or tutor to feed the computer any material, in whatever language they please, by simply typing it on the keyboard. In this way the lesson can be tailored to a particular subject of interest to the student--i.e., current events, career or health information, or sports. The lesson can be scaled up or down by using simple or difficult words and shorter or longer sentences. The material is then converted by the computer

into a series of exercises which require the student to interact with the step-by-step elements of the reading process.

A major objective of the two library projects is to test the attitudes of librarians and tutors as well as their ability to master the system. After a half dozen orientation sessions totaling 15 hours, library staffs and volunteer tutors, all new to computers, were able to produce their own specifically-targeted programs. The subjects include money management, vocational information, income taxes, driver education, and consumer affairs. Extensive evaluations and further development are being conducted by Dr. Duffy at Carnegie Mellon University.

Extent of CAI Use

The extent to which CAI has penetrated the adult basic education community is unknown. No data have been systematically collected and there is no central communications network. Fragments of information point to great variations from one literacy-providing sector to another. These range from the virtually non-existent use of technology among the voluntary providers to a very limited use by corrections, job-training, and state ABE programs, to the military at the top. Some random examples follow:

--In 1980, more than $70 million was spent by the military for basic skills education and training, with a significant portion for CAI. According to 1984 Department of Defense figures, one-third of all new recruits read at or below the eighth-grade level. These enlistees have to digest information that will enable them to operate and maintain sophisticated, costly, and dangerous equipment. It is no surprise, then, that the military is the most advanced in software and systems development.

--In the correctional system, a 1981 Ford Foundation study found that computer-related learning experiences were available to some 40 of the nation's 600 federal and state prisons. The number is thought to have grown substantially since then. To gather solid data, the Correctional Education Association is about to launch a $200,000 survey of the nation's prisons to determine the extent and nature of computer instructional uses. In addition, between 1984 and 1985, some $1 million in grants to 15 states will have been made by the National Institute of Corrections to enhance or develop such programs.

--In St. Paul, Minnesota, a $1.3 million community CAI program was opened in a walk-in storefront earlier this year. Called TLC for Technology Literacy Center, the program is funded by a consortium of foundations and the St. Paul Public Schools. Among its goals are to train educators and to conduct research on applying the technology to basic literacy instruction.

--Under Section 310 of the Adult Education Act, states are required to spend at least 10 percent of their federal ABE funds for innovative efforts. A review of these activities reveals that in 1984 and 1985, only 17 and 23 states respectively sponsored computer-related basic skills projects. CAI projects made up less that 15 percent of all pilot programs funded. The 1983 and 1984 expenditure for such CAI efforts was less than $250,000 a year. This sum increased in 1985 to over $650,000, and brought with it a shift in emphasis from computer--assisted to computer-managed instruction. Fortunately, these negligible ABE figures do not reveal the entire story. A few states have moved toward more extensive CAI for adult basic skills. Massachusetts, for example, has a statewide plan to introduce computers into its ABE program, and more than half of ABE's learning centers already have them. Other more advanced states are Florida, new York, and the four-state Northwest Consortium of Oregon, Washington, Idaho, and Alaska. In California, Illinois, and Michigan computer technology is part of the adult basic education scene but the prevailing use has been for instructional management.

With so few overall facts available on the state of the art, BCEL consulted experts in the field and asked them to estimate the total extent of CAI usage for basic skills instruction among all literacy providers in the nation. On a scale of one to ten, not a single response exceeded two.

Issues for The Future

What elements impede the wider use of computers to teach adult basic skills?

Hardware. Access to hardware is not the serious barrier that might be supposed. Microcomputers are quickly becoming commonplace in American society. Their growth in the public schools has been explosive, doubling annually since 1981. Of 700 school administrators recently surveyed, 94 percent reported that their students had access to school computers. (Apple had a commanding lead as of 1983 with 49 percent of the school market: Radio Shack at 21 percent and Commodore at 15 percent were the next most popular.) Hardware prices have fallen dramatically. A microcomputer and printer can be bought today for $700 to $1,000 and the median price for a program is presently around $43. Manufacturers, vying for superior position, have donated thousands of machines to school districts, with a market value in the millions of dollars. Some observers believe the razor/razor-blade principle may soon apply: manufacturers may give the machines away in order to sell the software.

This does not mean that access is universal. Many populations are still deprived of the opportunity to use computers, especially disadvantaged groups. But this problem can be overcome if there is a will to do so. The Houston Independent School District, for example, funds a program called "Computers Can," which lends for home use 4,500 school computers and then trains parents in their use. The target populations are economically disadvantaged. Another Houston project, "Compu-Buy," lets parents buy the machines at district-negotiated bulk prices and provides a lending library of educational software. The district also cooperates with the local college ABE program, providing adults with night-time access to its computers. In another example, the Boston Computer Access Council--comprised of representatives from business, education, ABE, job training, and the handicapped---meets monthly to explore ways to facilitate access to the thousands of computers in the city for disadvantaged citizens. The Houston and Boston approaches can easily be adapted elsewhere. And libraries and community organizations have by their nature a capacity to make both computers and computer services available to neighborhood residents.

Software. Far more difficult is the problem of quality software. It is a well known axiom that computers are only as good as the programs that feed them. According to EPIE, the Columbia University Educational Products Information Exchange (which evaluates computer programs for the schools), 60 percent of educational software "is not worth the money." (It is estimated that $20 million was spent by the schools in 1983 for software, with another $110 million spent on educational software for the home.) Most of the material fails to exploit the computer's capacity to develop problem-solving and independent reasoning skills in the user. Drill and practice programs, for instance, make up half the inventory, and tutorials another quarter. These serve a useful purpose for adults learning basic skills, but they do little to foster independence of thought. Simulations and the higher order problem-solving programs represent less than a fifth of the inventory.

More to the point, there are virtually no programs available that have been designed specifically for adult basic education students. PLATO is the only comprehensive basic skills curriculum designed for adults, yet even it is not geared to mature persons and their daily lives. The content was designed chiefly for 16-21 year olds and most adult students are much older. The average age of students in the ABLE program is 36. Moreover, a third-grade reading level is required to use PLATO at all, and many adults have a lower level of achievement.

Throughout the field the critical need for appropriate software is stressed over and over again. But program development is extremely costly, and software publishers are either uninformed about the size of the adult basic education market or not willing to risk the investment.

It should be noted that Senator Albert Gore has introduced into Congress a bill calling for

establishment of a $150 million revolving fund to support venture capital organizations in developing educational software. It is to be hoped that where the focus is on adult basic skills, researchers, literacy providers, and the software developers will come together to plan needed curricula.

Other barriers. The other main elements that impede forward movement have to do with prevailing attitudes among educators, lack of training, and poor patterns of communication. Educators are historically resistant to adopting new techniques, and the idea of computers for adult basic skills is not yet sufficiently included in their thinking. Beyond that, professionals need training to be able to work with computers and feel comfortable with them, to evaluate and select software, and to integrate computers with the rest of their instructional program. And volunteers, too, must be involved in these activities. Furthermore, the lack of a central communications network for gathering information about computers in basic skills and for sharing experience leaves practitioners isolated and without support for improving current programs or developing new ones.

The problem of adult illiteracy is too massive to be solvable in traditional ways alone. Most experts agree that to sharply increase the numbers of adults being instructed, as well as to achieve economies of scale in the long run, the use of computers and other technology will be vital. Thus it behooves those interested in advancing adult illiteracy in the U.S. to investigate further and seek avenues for promoting the greater use of computers. And it should be kept in mind that as computers become more commonly used in adult basic education a goal should be to assure that persons most in need of educational help have access to them. Otherwise the gap between the "knows" and "know-nots" will be enlarged.

As a next step in exploring some of the issues only touched on in this article, an invitational conference is now being planned that will bring together literacy practitioners in the U.S. who have experience using computers in their programs. The conference, tentatively scheduled for this fall, will be sponsored by the Gannett Foundation with the participation of BCEL, B. Dalton Bookseller, and others. BCEL itself is planning a full-length monograph on computers and adult basic skills to be available by the end of the year.

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Acknowledgments

The participants and beneficiaries of the Adult Literacy and Computers Conference wish to express their appreciation to the following companies and organizations who made financial or service contributions:

B. Dalton Booksellers

Lavine Newspaper Group

Minnesota Adult Reading Campaign

Spring Hill Center

Wilson Learning

Special thanks to the Saint Paul Public Schools.

David Bennett, Superintendent of Schools

BOARD OF EDUCATION:

Daniel Bostrom
William Carlson
Margo Fox
James Griffin
George Janisch
Al Oertwig
Eleanor Weber

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